

MARINE REVIEW.

Vol. XIV.

CLEVELAND, O., AUGUST 13, 1896.

No. 7.

Three Immense Grain Cargoes.

The Queen City, Coralia and W. D. Rees, three of the largest class of steamers on the lakes, all built in Cleveland during the past winter, carried away from South Chicago within two days 516,130 bushels of corn and 61,650 bushels of wheat, making a total of 577,780 bushels or 16,300 net tons. An idea of the volume of these cargoes may be had from the fact that it would require $5\frac{1}{2}$ miles of freight cars, making 27 trains of 30 cars each, to transport what these steamers did. The cargoes were carried at a cost of an average of $1\frac{1}{4}$ cents a bushel. There was considerable rivalry among the masters of the vessels as to which would carry the largest load. The particulars as given out by the Chicago elevators are as follows:

Queen City—205,500 bushels corn, 5,754 tons, $17\frac{1}{2}$ feet draft.

W. D. Rees—124,500 bushels corn and 61,650 bushels wheat, 5,335 tons, draft not given.

Coralia—186,130 bushels corn, 5,211 tons, 16 feet draft.

It is unfortunate that the Coralia's cargo was for Fairport instead of Buffalo, as there is only 16 feet draft at the elevator at the former port, and her rival was enabled to load $1\frac{1}{2}$ feet deeper. Figuring comparatively, the Queen City on the Coralia's draft would still have some 73 tons more cargo, this leaving them in about the same position as before. The Queen City has the Babcock & Wilcox water tube boilers, while the Coralia, has Scotch boilers. The former are supposed to weigh from 60 to 70 tons less than the boilers in the Coralia.

Steam Yacht Race.

If nothing unusual arises two good-sized steam yachts will race at the Cleveland regatta Thursday afternoon. The yachts are the Enquirer owned by W. J. Conners of Buffalo, and the Say When owned by W. J. White of Cleveland. Both are self-made men, Mr. Conners having gained his wealth in the stevedore system and Mr. White having got his start in the chewing gum business. Both men are plucky in business ventures, and if either withdraws from the race it will be for good cause. Both believe implicitly in the speed of their yachts. The Enquirer was built during this year, having come from the Union Dry Dock Company's yard recently. The Say When was built by the Herreshoffs at Bristol, R. I., in 1888, the hull being of mahogany, while the Enquirer is of steel.

The particulars of the two yachts are as follows:

Enquirer:—146 feet long, $17\frac{1}{2}$ feet beam, and 10 feet deep, having triple engines 10 $\frac{1}{2}$, 17 and 27 by 16 inches stroke, built by Hodge of Detroit, the boiler being of the water tube type, Taylor pattern and built by the Detroit Screw Works.

Davidson Will Build Two Tugs.

A Detroit correspondent writes as follows: While repair work is about all that is expected at this time at the different marine engine works here, it is very gratifying to note an order that has just been placed with the Frontier Iron Works by Capt. Davidson of West Bay City, for two complete outfits for tug boats. The engines are to be of the fore and aft compound type, cylinders being of 15 and 30 inches diameter by 26 inches stroke. Steam is to be furnished by boilers of 8 feet 6 inches diameter and 13 feet long, with a working pressure of 130 pounds. Independent condensers will be furnished as well as feed pumps, etc. The same firm are making considerable repairs to the Alanson Sumner, a small steam barge lately rebuilt from a tug of the same name.

Engineer For the Chicago Ship Building Co.

The REVIEW has the pleasure of announcing the name of the new superintending and designing engineer of the Chicago Ship Building Company's new engine works. It is Mr. Henry Penton, at present occupying a similar position with S. F. Hodge & Co., Detroit. He will take his new position the first of September. Plans are completed for the new works, and work on them will commence soon.

Beginning with a common school education, Mr. Penton served

an apprenticeship as a machinist, afterwards taking up marine engineering, and has served as chief engineer of various lake and ocean steamers. He gave his spare time to study, whether afloat or ashore, and so acquired a knowledge of mechanical drawing. During two or three winters Mr. Penton was associated with the late H. W. Granger, M. E., of Detroit, really the father of the modern lake marine engine. For five years he was mechanical engineer to the Frontier Iron Works, whose work has become well-known not only on the whole chain of lakes, but on both seaboard. Some of the more remarkable engines that have come from his hands are the W. H. Gilbert, which is said to have beaten the famous Chemung; the Pacific coast steamship City of Everett; the Madagascar and Nicaragua, whose performance made quite a stir, and the famous whaleback towing steamer Pathfinder. It is said of Mr. Penton and his engines that he has "been there" himself and that his engines are designed not only to do their work cheaply but to be as convenient and handy for the engineer as possible. He is thirty-one years of age and has lots of time yet before him.

Lake Freight Situation.

Grain is moving pretty freely at Chicago at a little better figure than is paid on ore, but otherwise the lake freight market is very quiet and is in practically the same condition it was a week ago. Chicago shippers are taking care of nearly all the wild Lake Michigan traders and only for the activity in that branch of the trade many of the wild carriers would be forced to lay up as ore cargoes are very scarce. Furnace men have in some cases notified ore sales agents that they will not want ore that they arranged for early in the season and shippers have in turn arranged to carry some ore that was covered by lake freight contracts over, and some of it may not be moved until next season, although it will all be brought down if dock room can be found for it. Ore is going forward to the furnaces very slowly and while shipments from the upper lake ports have been cut down materially the docks at the receiving ports are filling up, and some of them are already in pretty bad shape. Rates are unchanged at 60 cents from ports at the head of Lake Superior, 50 cents from Marquette and 40 cents from Escanaba but very little chartering is being done.

Coal boats are offered at 25 cents to all ports and boats from the head of Lake Superior are more plentiful than cargoes. Owing to the loss of time in getting cargoes for Lake Michigan owners of large lake steamers have sent their boats light to Chicago for corn at $1\frac{1}{4}$ cents. Several small vessels have been laid up during the past week, but others that were out of commission have started out again so that the number of boats in ordinary is about the same as it was last week. There is nothing in the outlook that indicates a change and everything points to a quiet freight market the balance of the month. A little grain is moving from the head of Lake Superior but not enough to cut any figure and owners do not look for an active demand for tonnage from that quarter until next month.

Winter's Work for the West Superior Yard.

At the recent meeting of the board of directors of the American Steel Barge Company, enough work was planned to keep the West Superior yard busy during the coming winter. Capt. McDougall is quoted as follows: "We have planned the building of a steamer 408 feet long, 48 feet beam, and 27 feet deep, to be in all respects a duplicate of the John Ericsson, except larger. We will lengthen barges No. 201 and 202 which were brought from the Atlantic coast by putting 61 feet in the middle of each one. We are to build a new dry dock 450 feet long by 100 feet wide at the top and 56 feet wide at the bottom with 19 feet of water over the miter sill. All of this has been approved by the board of directors and the money is ready to pay for it. I am preparing plans and models for the large vessel, getting out details and estimates and doing other work in connection with the commencement of the ship." Work will be commenced as soon as there is assurance of a settled condition of the money market. This may mean until the fall elections are over.

Commending Babcock & Wilcox Boilers.

In a paper read by J. R. Fothergill, at a recent meeting of the Northeast Coast Institution of Engineers and Shipbuilders, was the following letter from the superintending engineer of Wilson Sons & Co., Hull, England:

"I believe we were the first in this country to try Messrs. Babcock & Wilcox's water-tube boilers in a sea-going steamer; this was over three years ago in our steamship Nero. This boiler is running quite satisfactorily, and the ship has not lost a day for boiler repairs up to the present. A few tubes in the feed water heater have been renewed, and probably the whole of them will require renewals shortly, as they appear to corrode very rapidly. In the boiler proper only one or two tubes exposed to the fire have been renewed, at a trifling cost. About twelve months ago we fitted a new steamer, the Hero, with a pair of boilers by the same makers, but somewhat modified in details, no heater was fitted, and the tubes were larger in diameter. We have had considerable trouble with the bottom row of tubes in these boilers, and in consequence of this, in a third ship, the steamship Cameo, which we have fitted with Babcock & Wilcox boilers, we have reverted to the smaller tubes (slightly larger than the Nero's), and up to the present no tubes have given away, neither have any repairs been required to these boilers. As regards consumption, there is not much either way; comparing the steamships Hero, Nero, and Cameo. With our most economical forced draught and ordinary boilers they fall slightly short, but still give as good results as ordinary averages with the ordinary boilers. I think the direction in which economy in consumption is to be sought for in the water-tube boilers is in the arrangement of baffles over or amongst the tubes, so as to properly utilise the heat that frequently too easily goes up the funnel. We have, as you are probably aware, one steamer fitted with four Belleville boilers. We have not been fortunate in our experience with these, but perhaps this has been from causes other than the design although it is certain that the Belleville boiler is more difficult to clean and repair than is the Babcock & Wilcox, whilst with us the consumption has been greater with the Belleville than with the Babcock & Wilcox."

A Look into the Future.

An exchange comments on the opening of the new Soo lock as follows: "The opening of the commerce of the great lakes of the new lock, capable of accommodating vessels of deep draft, is regarded by head of the lake business men and students of transportation as an event of deep significance. Within a short time there will be a minimum depth of 16 feet or more all the way through the connecting waters of Lake Superior and Huron. This means that the Lake Superior ports will be placed on a footing with those of Lake Michigan as regards available draft for transportation of freight to and from the foot of the lake system.

"Chicago will have no advantage over Duluth, in the future in that respect, as she has had in the past. Lake freights from Chicago to the lower end of Lake Erie have ever been lower than from Duluth for the reason that vessels could take a heavier cargo out of the great Lake Michigan metropolis. The completion of the American lock, and the deepening of the shallow places in the St. Mary's river, will adjust the differences between Duluth and Chicago, as regards lake freight rates, for the conditions will no longer be unequal. The distance from Chicago to Buffalo is slightly less than from Duluth, but the facilities for handling freight of all kinds are far superior at Duluth than at Chicago, and that fact more than offsets the advantage of distance.

"It is expected that, with the completion of a deeper channel at the Encampment, rates will experience an equivalent drop at the head of the lakes and that under natural conditions they will never be as high as they have ranged in the past. The opening of the new American lock and the deepening of the river connecting Huron and Lake Superior will be a powerful blow to the small vessels which were such prosperous members of the maritime community seven or eight years ago. There are few of them, however, that have not paid for themselves more than once.

"The greatest and most direct benefit which will accrue to Duluth as a result of the placing of this Lake Superior route on an even basis with the Chicago route, via the lakes, will be the certainty that a vast amount of grain and other products produced in the territory equally distant from Chicago and Duluth, will come that way, instead of going via Chicago. Corn is one of the products which much can be ex-

pected of in this connection. The shipment via Duluth is preferable on account of the better facilities for handling and for other reasons of more or less influence."

In General.

The Harlan & Hollingsworth Co., Wilmington, Del., will build a large ocean tug for the Philadelphia & Reading railroad.

The Pusey & Jones Co., Wilmington, Del., will build a side-wheel passenger steamer for Venezuela service., 131 feet long and 25 feet beam, having two compound engines.

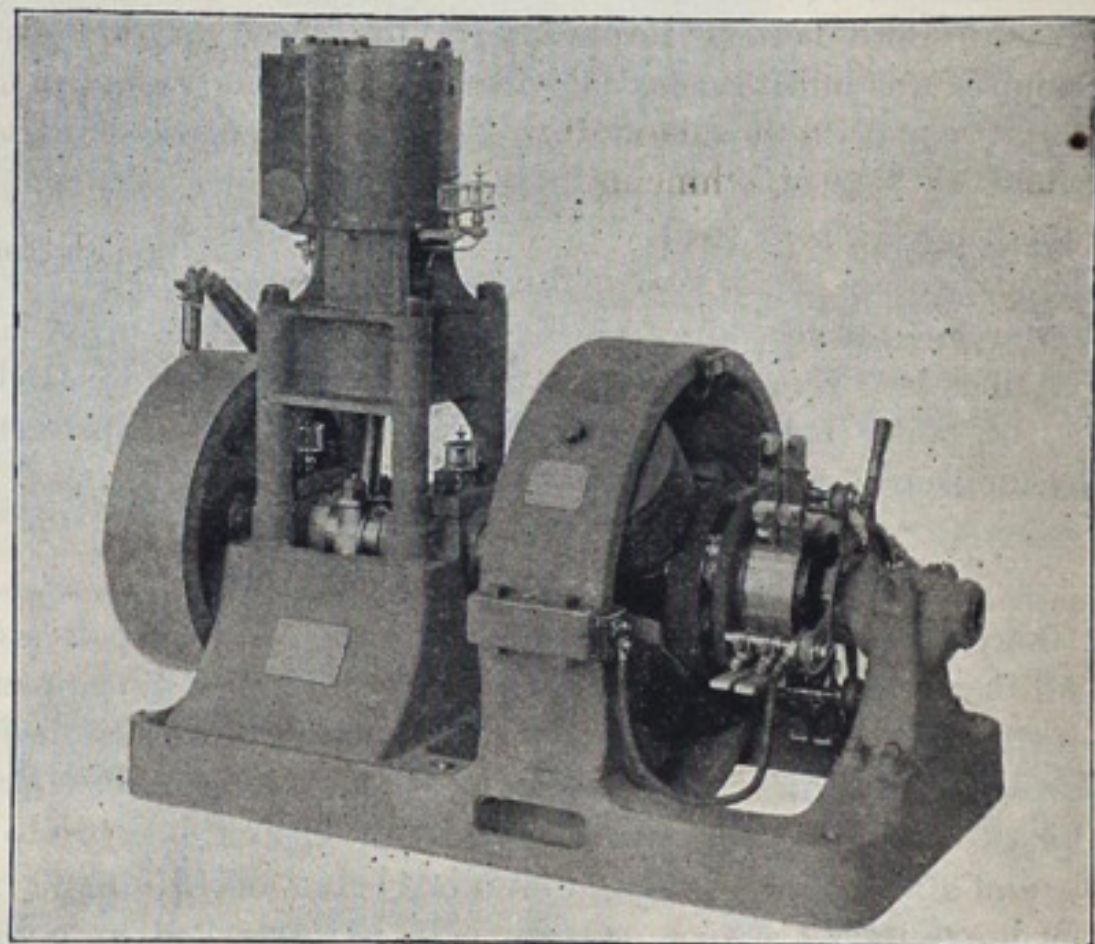
The Richelieu and Ontario Navigation Co., with its usual enterprise, has made soundings in the St. Lawrence river between Coteau and Beauharnois, and has discovered a new channel, which will simplify the navigation of the Split Rock rapids greatly.

The greatest waves known are these on the Cape of Good Hope, where under the influence of a northwest gale, they have been found to exceed 40 feet in height. Off Cape Horn they have been measured at 32 feet from trough to crest, and in the North Atlantic waves from 20 to 25 feet are by no means uncommon. Ordinarily, however, they rarely exceed 8 or 10 feet, and all accounts of their running "mountain high" must be received as mere poetical exaggerations.

A new port for Canadian coal shipments is being constructed on the north side of Cape Breton by an American company, which will work in opposition to the Dominion Coal Company. They are building a breakwater on the northern side of McIsaac's lake, where they intend to dredge the channel into the lake, to keep the sand which is all on the northern side of the intended harbor from filling up the channel when dredged, and to protect the dredge while at work there. They are also building two wharves in the lake, one for general freight and the other for the shipment of coal. The railroad between the coal mines and the lake is nearly all graded.—Marine Journal.

Single Cylinder Engine and Dynamo.

In a recent issue we illustrated and described a compact double cylinder engine and dynamo especially designed by the General Electric Co., for supplying electricity for light and power purposes on ship-board. In addition to this type that company has also designed a single cylinder engine for direct coupling to the dynamo, making a set equally as compact. These single cylinder sets are built in capaci-



ties of 7, 10, 15, and 25 kilowatts. The engines are of simple design and have but few parts which being constructed to templates and gauges, are interchangeable. They occupy a minimum floor space, the engine bed being carried out to support the dynamos. The weight of the complete sets has been brought down as low as possible, by careful coreing out of the bed, etc., and every part of the engine has been the object of special care both in design and workmanship. The generators are of the multipolar type, with iron-clad armatures. These single cylinder generating sets have already been installed on several vessels, and are now operating successfully in every case.

The Nickel Plate road sells one fare excursion tickets to Erie, Pa., account of the L. A. W. bicycle meet and races, August 17th and 18th.

Around the Lakes.

The schooner *Emeline* was passed fifteen miles southeast of Death's Door in a capsized condition.

As a result of stranding of the steamer *Samoa* in the St. Lawrence river, sixty-three broken frames were discovered when she was docked at Buffalo.

The Thompson Tug Line has purchased the tug *Crusader* and raised her. The tug *Brockway* took her to Port Huron where she will be rebuilt.

Steamer *R. G. Stewart* stranded on Wiggins' reef, near Manistique, Mich., while transporting a circus to Escanaba. She was released with slight damage.

Tonnage of the new Minnesota line steamer *Maricopa*, just completed at the works of the Chicago Ship Building Co., is 4,223.57 gross and 3,669.85 net.

Carkin, Stickney & Cram, Detroit, were the lowest bidders on Sandusky harbor work, and they were awarded the contract amounting to some \$15,000.

The light-house board awarded a contract for constructing seven cribs in Hay lake channel, St. Mary's river, to Eslow & Munroe, of Charlevoix, Mich., at their bid of \$5,622.

The wrecker *Root* has ceased trying to locate the steamer *Pewabic* by sweeping, because the sweeper caught on so many rocks. Another trial will be made with the diving-bell and lights.

The steamer *Thomas Wilson* got away from S. F. Hodge's engine works at 8:30 Saturday morning with her new high pressure cylinder. She went there Thursday and this is considered very quick work.

The Cleveland Dredge Company has six dredges at work at Ashtabula on its 20-foot channel contract with the city, Lake Shore and Pennsylvania railroad companies, and the work is being pushed rapidly.

There seems to be a question as to the extent of the damages to the *St. Louis*, resulting from collision with the *Williams*. The owners say she is a total loss, and owners of the *Williams* say the boat can be repaired at small cost.

The Columbus, Sandusky & Hocking Railroad has leased several car ferries and will bring them to Lake Erie to transport traffic from Sandusky, the northern terminus of the line, to some point on the Canadian shore of Lake Erie.

A diving-bell shipped to Alpena, recently will be operated from the steam barge *Jenks* in an effort to locate the steel steamer *Norman*, sunk near Middle island during May, 1895. The bell has telephone and electric attachments.

The light-house board awarded a contract for the erection of a keeper's dwelling and front and rear beacons for the Grassy island north channel light station, Detroit river, to John Ginsett, of Wyandotte, Mich., at his bid of \$5,790.

The establishment of terminals at Manitowoc by the Wisconsin Central and Chicago & Northwestern railways has attracted the attention of the Lehigh Valley railway people, and steamers of their fleet will hereafter stop there for package freight.

Rev. Sarah Bromwell consulted recently with the Graham & Morton Co., concerning the \$10,000 reward offered for the discovery of the lost steamer *Chicora*. She claims to have interviewed the spirits of those lost in the boat, and says that it lies in 40 feet of water.

There are 75,000 tons of iron ore on the Missabe dock in Duluth, and 500 car loads waiting to get into the dock. The Duluth & Iron Range road has laid off a number of ore trains, and a large number of men employed in making improvements, which were deemed necessary a while ago.

According to reports current at Muskegon, Mich., the Chicago & West Michigan Railroad Company and the Crosby Transportation company have entered into an arrangement whereby the latter company is to put on next winter between Muskegon and Milwaukee a steamer to run in connection with the road. It is not known whether one will be built or chartered.

Capt. Dunn of the Canadian steamer *Petrel* has located a wreck in Lake Erie 22 miles south and west from Rond Eau, three miles north of the boundary line. It is supposed to be the *Little Wissahickon*, lost with four of her crew last month in tow of the *Donald-*

son. The wreck of the schooner *Dauntless*, lost on the same day in the same storm was also discovered the same day.

The steamer *Brazil* arrived at Sheboygan at 5 o'clock Friday morning with 2,953 tons of coal. It was unloaded and at noon Saturday, she was at the Armour elevator. At 5 o'clock she had on board 105,000 bushels of corn. At 5 o'clock Sunday she was abreast of Sheboygan bound down, having handled 6,000 tons of cargo and navigated 280 miles in forty-eight hours.

Col. Smith, U. S. engineer, Cleveland, suggests having a steel steamer built at a cost not to exceed \$20,000, which should replace the steamer *Swansea*. It is recommended in the interest of economy that \$10,000 be taken from the Toledo appropriation, \$2,000 from the Cleveland, \$1,500 each from Sandusky, Lorain, Fairport and Ashtabula, \$1,000 from Conneaut, and small sums from other ports to make up the \$20,000.

The death of Capt. Richard D. Gardner, of the steamer *Commodore*, removes one of the most faithful and efficient masters in the lake service. He was in the Western line twenty-six years, which he entered as a boy of 18, being only 44 at the time of his death. When he left his boat about three weeks ago it was supposed that he would soon be able to return to her. He lived in Buffalo and leaves a widow and five children.

The funeral of Mrs. Helen Bradley, widow of Capt. Alva Bradley, and mother of M. A. Bradley, was held Sunday in Cleveland. The services were conducted by Chaplain Jones, Rev. Oliver Burgess, and Prof. Currier. The pall-bearers, were the following well-known vessel men, business associates of the father and son: W. C. Richardson, Capt. George Stone, George Warmington, L. A. Cobb, J. H. Palmer, and J. C. Gilchrist. She was known as one of the most philanthropic women in the city.

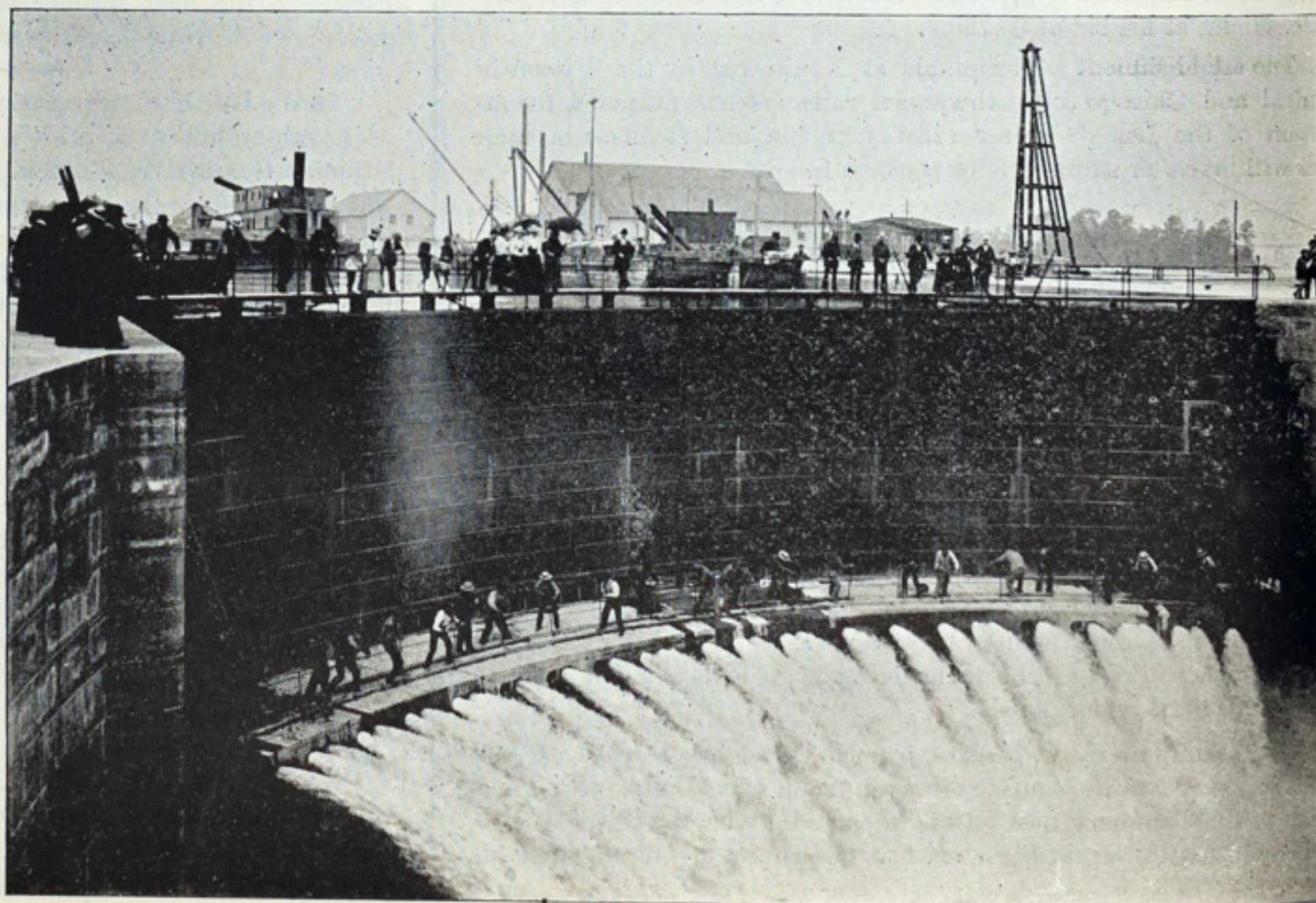
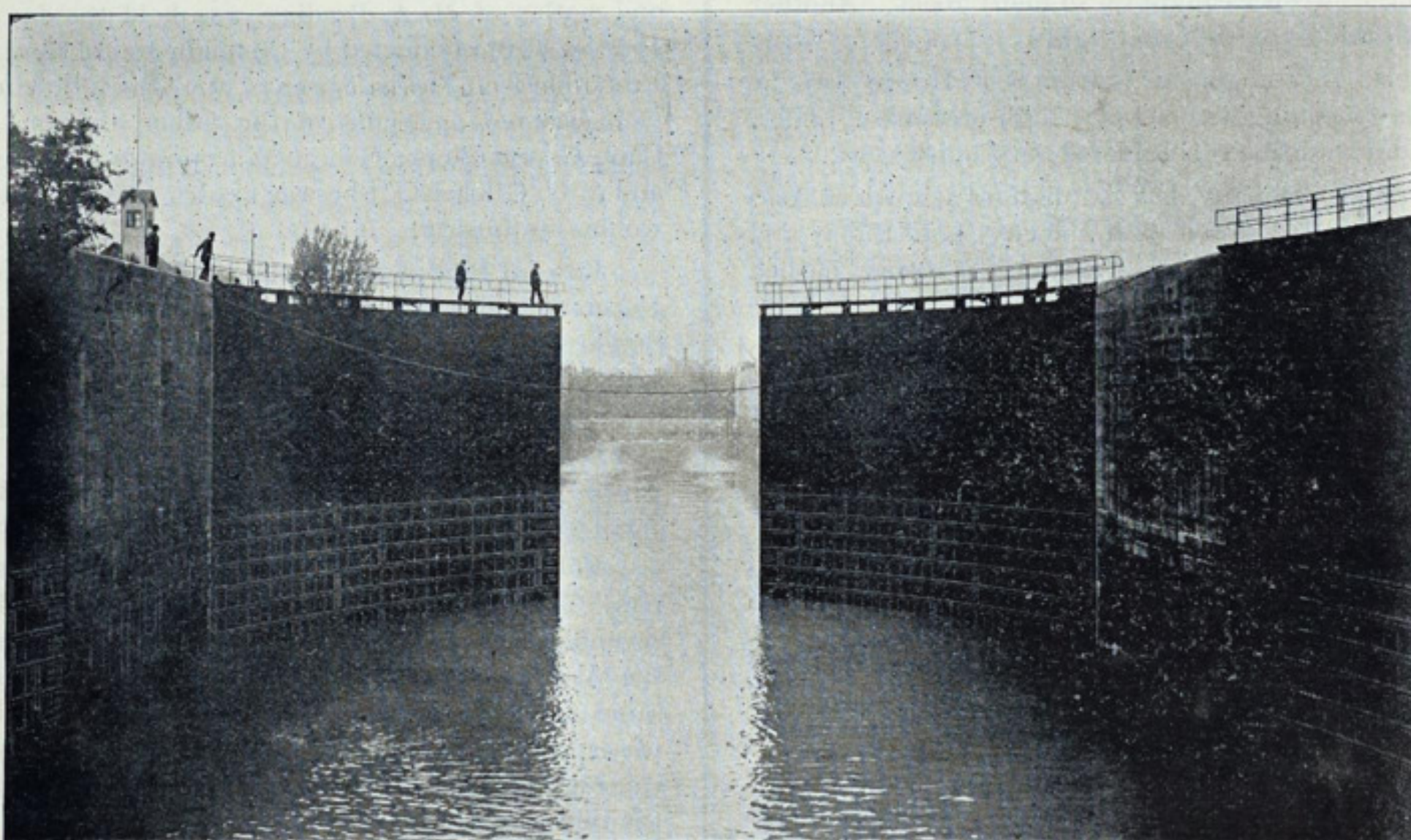
Edward Henkel was instantly killed as a result of the steamer *Normandie*, sheering into his steam yacht *Azalia*, lying at Port Huron, Sunday. The yacht was starting on a cruise to Mackinaw and Georgian Bay. He was in the grocery business in Detroit and his father is a well-known capitalist. A letter from him to the *REVIEW* concerning charts for the trip he was about to take arrived at the same time as papers announcing the accident. The steamer *Saginaw* was also injured at the same time. The *Normandie* was in charge of the mate.

Following are dates of some early lake passenger steamer disasters: In 1831 the *William Peacock* burst her boiler, scalding to death seventeen persons, besides injuring many others. A steamer called the *Washington* was soon after wrecked, and another steamer of the same name, June 16, 1838, was burned and a large number of her passengers lost their lives. On Aug. 9, 1841, the *Erie* burned and became a total loss. Over three hundred passengers on board of her at the time were either drowned or burned to death. On June 17, 1850, the *G. P. Griffith* was burned, with a great sacrifice of life. The *Lady Elgin* was the next steamer to burn. The *Atlantic* foundered in a gale of wind, while the *Caspian* went to pieces in a storm.

In the United States navy yard at Brooklyn is a curious specimen of naval architecture, which is styled the "Intelligent Whale," although that is not its official name. It is a submarine boat, which was purchased by the government some years ago, and which was intended to be used in fastening torpedoes under war ships. It is a stumpy cigar-shaped boat, with its midship diameter equal to about half the length; on top is a conning tower for the steersman, whose head is in this tower or dome, while projecting side windows are also provided, affording a view forward, the windows being all protected by outside gratings. At the stern is a screw propeller, which is driven by four men by means of gearing. Movable horizontal rudders or fins control the depth of flotation. The boat was to carry a crew of thirteen persons. During a test several years ago, in the North river, the boat went to the bottom and did not rise, and before it could be raised by wrecking derricks all the men were killed. The craft was afterwards removed to the navy yard and placed on dry land in a deserted corner, where it now remains.

It is estimated that the loss on machinery, shops, etc. from the big fire at the shipbuilding works of Harland & Wolff, Belfast, Ireland, will foot up \$1,250,000.

Excursion rates to Omaha via the Nickel Plate road, August 16 to 24th account of the Y. P. C. U. of U. S. Inquire of agents. 230 23.



NEW 800-FOOT POE LOCK, SAULT STE MARIE.

Water-Tube Versus Cylindrical Boilers.

Editor MARINE REVIEW:—Although I may not always agree with your deductions, your editorials always interest me. In your issue of July 30th you admonish your readers to "Look for a boom in water-tube boilers," and you state that every issue of English trade journals of late brings accounts of the adoption of water-tube boilers in vessels of all kinds, etc. etc. That the "intensity" of this boom is more imaginary than real, I will with your permission endeavor to demonstrate.

When cylindrical boilers are used in steamers—as they are in at least nineteen-twentieths of all those constructed the world over—the manufacturers of them do not find it necessary to "proclaim" the fact from the "house-tops," as if it were some "unusual occurrence;" while the water tubular men, on the other hand, are "vociferous" every time they get an order, and make such a "hubbub" about it, that the "uninitiated" are apt to conjecture that they are doing a "tremendous" business. I think I have remarked before in one of my communications to the REVIEW, that "facts are stubborn things." To illustrate—steamers, as a rule, are run to make money for their owners. Steam yachts are an exception to this rule, and so are the navies of the world. There would be about as much sense in adopting water-tube boilers because the British or any other navy had adopted them, as there would be in adopting for the mercantile marine the same style of engines and other appurtenances that are put into pleasure craft or fighting machines, where the cost of maintenance cuts no figure or is a secondary consideration.

Now for those "stubborn facts." Thirty years ago it required $4\frac{1}{2}$ lbs. of coal to produce one indicated horse power in marine practice. To-day, in the most advanced practice with cylindrical boilers, it requires 1.07 lbs. of coal to produce one I. H. P. or less than one-fourth; and if any of your readers are sufficiently interested to know exactly how this is done, I beg to refer them to an article in Cassier's Magazine for this month on "Five Crank Marine Engines," by Thos. Mudd, with a cut of the engines. It is almost unnecessary for me to state, that this remarkable result is partially brought about by the use of Serve ribbed tubes in combination with the Ellis & Eaves induced or suction draft, and that by the use of these advanced appliances, the weight of cylindrical boilers for a given I. H. P. can be reduced about one-third from the weight required to produce the same power with cylindrical boilers with plain tubes and natural draft.

Neither you nor I will live to see cylindrical boilers superseded by the water-tubular type for the mercantile marine, for the simple reason that it "won't pay," to say nothing of other insuperable objections. The required power can always be obtained at less cost with cylindrical boilers if interested parties go the right way about it; and with less weight, if the increased quantity of coal it is necessary to carry is considered, to say nothing of the increased space taken up in a steamer by water-tubular boilers, which in many instances is enormously greater.

The steamer *Inchmona* referred to in Cassier's Magazine, belongs to Messrs. Hamilton Fraser & Co. of Liverpool, and was built by Messrs. Wm. Gray & Co., West Hartlepool, England. She is quadruple expansion and is the first steamer ever fitted with five cranks. Why five cranks instead of four, is fully and lucidly explained by Mr. Thomas Mudd, who has written the article.

The *Inchmona* is carrying 5,000 tons of cargo at 9 knots on a daily consumption of $11\frac{1}{2}$ tons of coal with a working pressure of 255 pounds. If you know of any steamers fitted with water-tubular boilers that are doing as well, or anywhere near as well, in point of economy, you will doubtless confer a favor upon many of your readers who are interested in ships, by "putting them in evidence" to sustain your prediction.

Very truly yours,

New York, August 11, 1896.

C. W. WHITNEY.

Pleased With Howden Hot Draft.

Editor MARINE REVIEW: Within the past few days, I have been aboard two lake steamers that have boilers fitted with Howden hot draft appliances, and as I have noticed some reference to this system of draft in recent issues of the REVIEW, it occurred to me that you would be interested in a few additional notes on the subject. The big side-wheel steamer *City of Buffalo* has the Howden draft, and Mr. T. F. Newman, general manager of the company, whom I met before boarding that steamer, told me that she was running on $2\frac{1}{2}$ tons of

coal an hour, all of it Ohio grade, which is not as good as the Pittsburgh steam coals. As the ordinary 3,000-ton lake freight steamer, running only 12 to 13 miles an hour, burns full two tons of coal per hour, it would seem that the fuel consumption of the *City of Buffalo* is very low, especially when it is known that she runs regularly 18 or 19 miles an hour, and has as many as twelve auxiliary engines. But Mr. Newman, who is very much pleased on account of the low consumption of fuel on the *Buffalo*, makes a stronger comparison, as he says that she burns practically no more fuel than the *State of Ohio*, the older boat of the line.

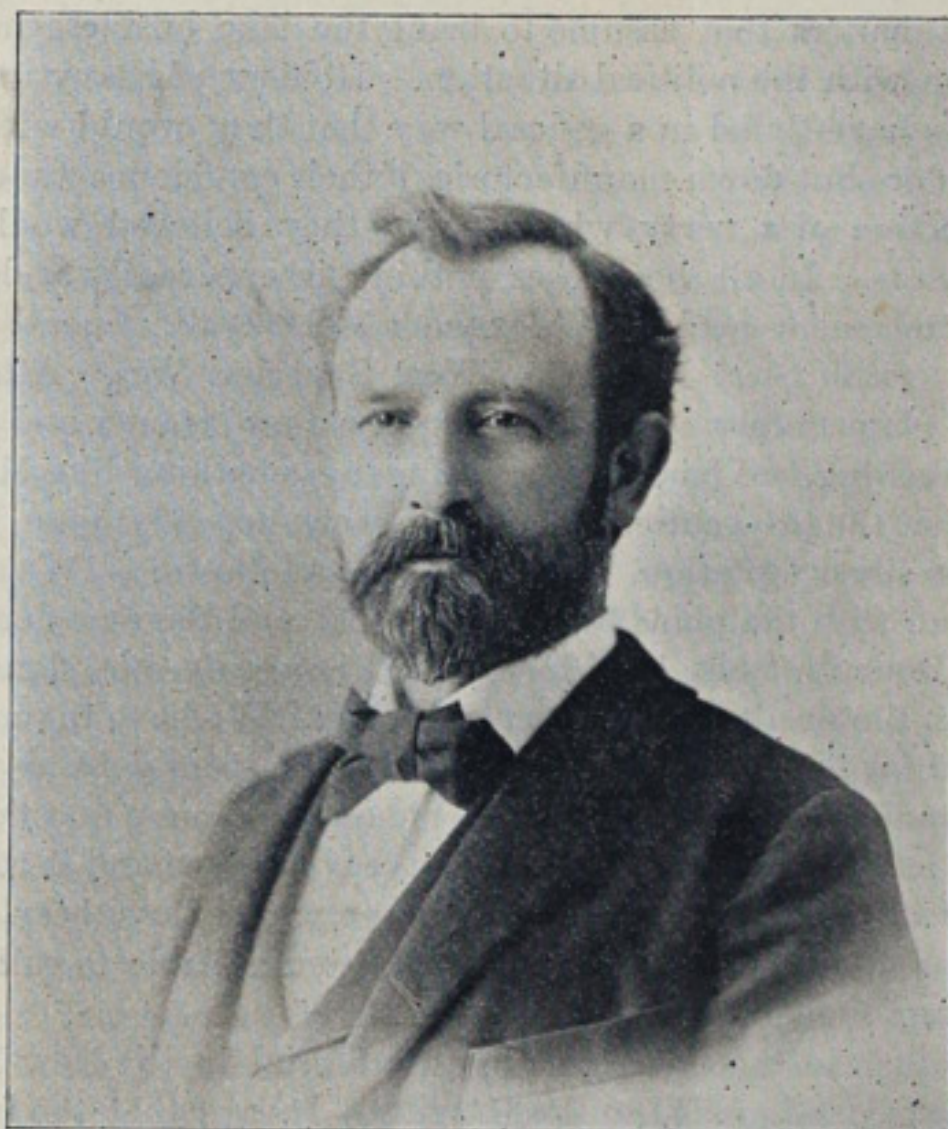
But aside from the question of economy, the great advantage of this draft to my mind is the positive blessing that it secures to men in the stokehold, which can be left open. This is a great advance over any closed stokehold system, which as the name forced draft implies, involves the closing up of all openings between the hold and the outside air, the interior of the stokehold being under constant pressure of air. I have wondered why men who have vessels that are heavy consumers of fuel have not taken more readily to this system of draft. Sometimes I think it is because they are slow to try new appliances of any kind, fearing complications, annoyances to engineers, etc. But there is nothing to annoy an engineer and nothing complicated about this system. The air is simply drawn by means of a fan through heating chambers situated at the front ends of the boilers, where it is heated by the gases from the furnaces as they pass to the smoke-stack. Engine room as well as fire hold is cooled by it. An ordinary fan works noiselessly and takes up little room, and the power required to work it is hardly worth mentioning, as it would not be more than five horse power on a freight steamer having main engines that would develop 1,500 horse power.

M.

Chicago, Ill., August 10, 1896.

Conrad Starke.

As a result of being thrown from his buggy, Conrad Starke died at his residence in Milwaukee Saturday morning. The deceased was born in Kohlenfeldt, province of Hanover, Germany, fifty-two years



ago, and settled in America nine years later. He came to Milwaukee with his brothers, C. H. and Henry Starke, and some time later they engaged in the towing business. Capt. Starke was also president of the Sheriffs Manufacturing Company, and was the sole proprietor of the steamer *E. A. Shores*. He had a large interest in the fleet of vessels owned by the Milwaukee Tug Boat company. Capt. Starke was first in command of the tug *L. H. Boole*. He then owned and commanded the tug *G. W. Tift*, later the *E. L. Anthony* and finally the tug *J. J. Hagerman*. He was known as a straightforward, honest citizen and was noted for his generosity and at the same time for a remarkable firmness of character. He knew no fear and was often found running a tug when no one else would venture out. He was an honorary member of Milwaukee branch of the Shipmaster's association.



DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio,
by John M. Mulrooney and F. M. Barton.

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient
binders sent, post paid, \$1.00. Advertising rates on application.

Entered at Cleveland Post Office as Second class Mail Matter.

The books of the United States treasury department on June 30, 1895, contained the names of the 3,342 vessels, of 1,241,459.14 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1895, was 360 and their aggregate gross tonnage 613,260.49; the number of vessels of this class owned in all other parts of the country on the same date was 309 and their tonnage 652,598.72, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1895, was as follows:

	Number.	Gross Tonnage.
Steam vessels.....	1,755	857,735.13
Sailing vessels.....	1,100	300,642.10
Unrigged.....	487	83,081.91
Total.....	3,342	1,241,459.14

The gross registered tonnage of the vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30, 1891.....	204	111,856.45
" " " 1892.....	169	45,968.98
" " " 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
" " " 1895.....	93	36,352.70
Total.....	347	335,433.98

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			Suez Canal.		
	1895*	1894	1893	1895	1894	1893
No. vessel passages.....	17,956	14,491	11,008	3,434	3,352	3,341
Tonnage, net registered.....	16,806,781	13,110,366	9,849,754	8,448,383	8,039,175	7,659,068
Days of navigation.....	231	234	219	365	365	365

* 1895 figures include traffic of Canadian canal at Sault Ste. Marie, which was about 1/2 per cent. of the whole, but largely in American vessels.

THUS far the slump in lake freights has not been connected with the political condition of the country, except by the general assertion that presidential years are not conducive to good business health. During the past week there has come to the notice of the REVIEW two important matters that assume to bring the lake business into direct connection with the political situation. Holders of heavy interests in other lines have stated in a general way that they would withhold investments or shut down manufactories if their confidence was destroyed by the election of a party whose policy they believed would injure such interests. In all these cases nothing is apparently as definite as the announcement made by Alexander McDougall, general manager of the American Steel Barge Co., West Superior, Wis. After giving details of plans involving the building of a new steamer and dry dock and lengthening two barges, amounting to something like \$1,000,000, he says that the prosecution of all this work depends upon the effect of the free silver agitation. He is quoted as follows: "We are going right ahead with the plans for the new boat and the new dock," said Capt. McDougall, "but how far we will prosecute our plans will depend upon the result of this silver agitation. We have the money appropriated for this work, but how far it will be spent depends upon the election and the sentiment of the people on the money question. The matter is left entirely with our executive committee and it will use its judgment in the carrying out of the plans which have been outlined. We are going ahead here, but the committee is liable to call the turn on us at any moment."

The other instance is given in an editorial in the New York Tribune, marked and mailed to the REVIEW. It says that the free silver agitation is responsible for the closing down of the important iron mines in Michigan, which but for this it is claimed would be operated as usual. In this case the fact of the mines being closed would seem to indicate that it is not the result of political fever, for men do not close up capital producing concerns to make political capital. As to the proposed withholding of a \$1,000,000 investment in case of the triumph of free silver, that is in the future, and workingmen in the West Superior and other lake ship yards can heed or ignore it if their own political conscience so dictates, but it involves the responsibility of gambling with employment for the winter. If the election of a silver man does jeopardize the ship-building and mining capitalists' interests and they do withhold investments through lack of confidence they can say to the workingmen "I told you so," and "You made your bed, now lie on it."

THE continuation of low freights gives weight to the suggestion of W. A. Livingstone, that unloading charges and fuel ought to bear part of the burden of the losses sustained in the present crisis. He is quoted as follows:

"One of the factors which is contributing to the hard times which the vessel operators are experiencing, is the fact that unloading charges and fuel are away up. Last year when the freight market was down nearly to where it is now, unloading charges on ore went down to 13 or 13 1/2 cents almost universally. Later when the boom came the charges were put up to 15 and 16 cents and in some places to 18 cents, and no vessel owners kicked, because they were getting good freight rates and were willing that others should share in the good times. But this year, with the market way down, the unloading charges remain where they were during the boom last fall and fueling charges are correspondingly high. It seems to me that it is time for the cost of unloading and fueling to be cut down so that the vessel owners may have a little chance."

THE additional draught of 1 1/2 feet to be obtained soon through the opening of the new Soo lock and other improvements, will add from 200 to 500 tons capacity to some 400 hundred vessels of the modern lake fleet. Estimating that only half of these vessels 200 will have the advantage of this through engaging in the Lake Superior trade, and figuring that the average increase of cargo capacity at 300 tons there would be a total increase of 60,000 tons capacity each trip. The new Rockefeller fleet will have a total capacity of 40,000 tons per trip. Thus for the last two months of navigation there will be an increase of 100,000 tons capacity per trip in the lake fleet. Figure five round trips during this two months, and 500,000, a half million tons more grain and ore than was produced last year, will be needed to satisfy the fleet for the down trips and 500,000 tons more coal and commodities for the up-bound trip. This is not figuring on 16 feet draft until October 1, nor is the Rockefeller fleet capacity figured until that time, although a number of them are now in commission.

"A correspondent writing to the secretary of Lloyds says he is informed on very good authority that the Spanish government contemplate augmenting the 'navigation tax,' an export duty on ores and minerals, which at present ranges from 1 peseta per 1,000 kilograms on smelted metal to a minimum on 25 centimos on crude ore. This tax falls on the shipowner, not on the merchant." If the same tax is levied on vessels carrying Cuban ore it may reduce the difference in price between that and Lake Superior ore at eastern furnaces.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes on Aug. 8, 1896:

	Wheat, bushels.	Corn, bushels.
Chicago.....	13,583,000	6,402,000
Duluth.....	6,267,000	12,000
Milwaukee.....	151,000	1,000
Detroit.....	301,000	14,000
Toledo.....	613,000	71,000
Buffalo.....	1,105,000	452,000
Total.....	22,020,000	6,952,000

As compared with a week ago, the above figures show at the several points named a decrease of 1,195,000 bushels of wheat, and an increase of 1,080,000 bushels of corn.

Go to picturesque Mackinac island via the D. & C. coast line. It only costs \$13.50 from Detroit, \$15.50 from Toledo, \$18.00 from Cleveland for the round trip, including meals and berths. Tickets good for 60 days, bicycles carried free. One thousand miles of lake and river-riding on new modern steel steamers for the above rates. Send two cents for illustrated pamphlets. Address A. A. Schantz, G. P. A., Detroit.

Special train excursion to Niagara Falls via the popular Nickel Plate road, Saturday, August 8. Train leaves Broadway depot at 10 p. m. \$3.50 for the round trip. Tickets good returning until August 10.

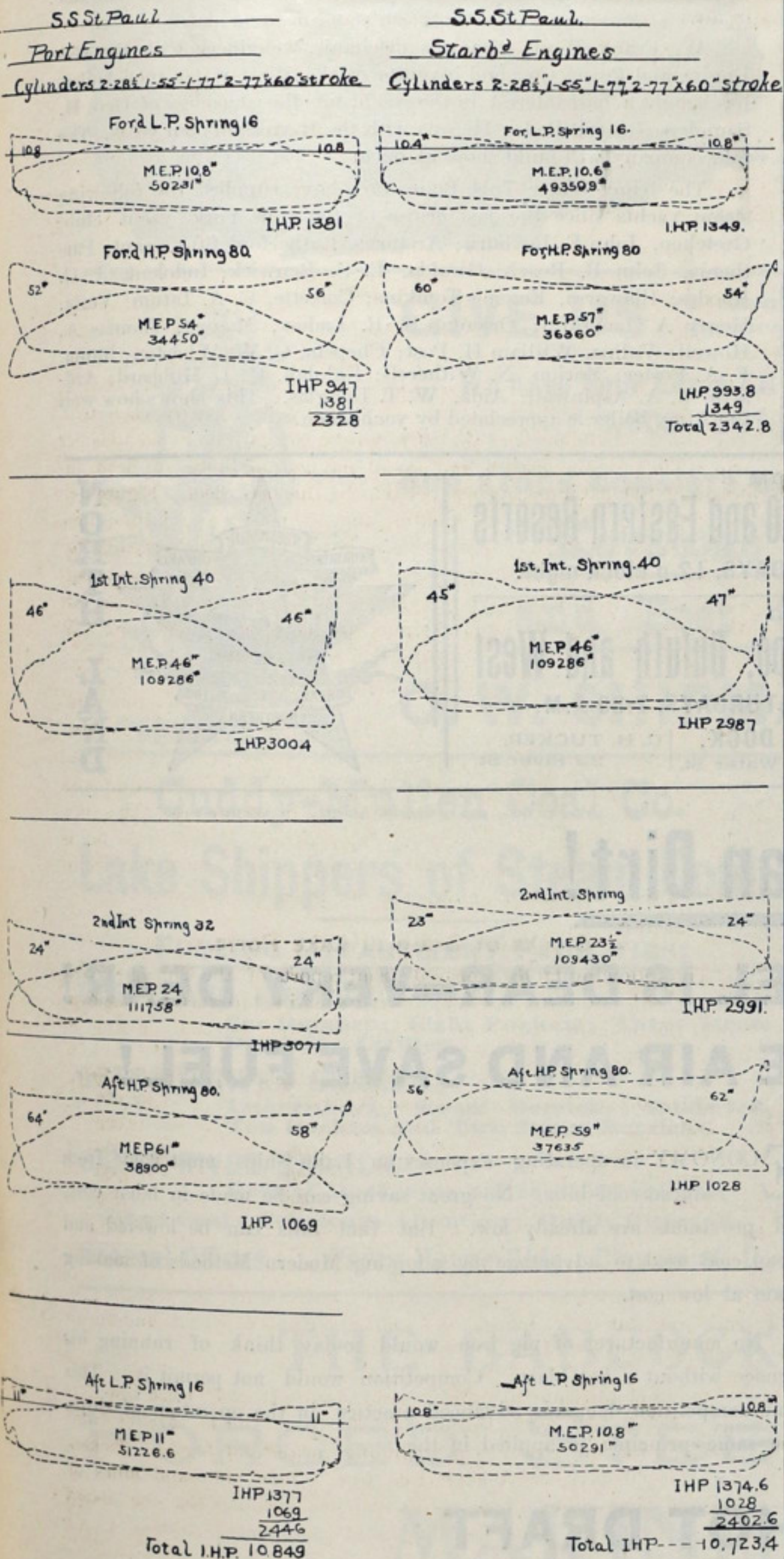
221-Aug. 8.

The Y. P. C. U. of U. S. Convention will be held at Omaha, and the Nickel Plate road will offer excursion tickets for sale, August 16th to 24th.

234 Aug. 23.

Great Economy of the St. Paul's Engines.

When the illustration and full descriptions of the St. Paul's engines were published in the REVIEW, of July 23, there was no data showing actual performance. Since then a full set of cards showing both engines and the data below, has been furnished. Transatlantic steamer lines are very jealous of indicator cards and working data. The competition is so keen to beat the record that they watch one another like hawks.



certainly a great compliment to the ability of Wm. Cramp & Sons as engine builders. Following is the data:

CARDS TAKEN JUNE 22, 1896.

Boiler pressure	198 pounds.
Vacuum	25"
Revo's port engine	90.7
M. E. P. to L. P. port engine	42.5
Total I. H. P. port engine	10849.
Revo's starboard engine	90.2
M. E. P. to L. P. starboard engine	42.1
Total I. H. P. starboard engine	10723.4
Total I. H. P. both engines	21572.4
Knots per hour	21.1
Temperature of feed water	210°
Temperature of discharge	116°
Temperature of sea	60°
Coal per 24 hours, tons	315.
Coal per I. H. P. per hour	31572.4 = 1.22 lbs.
Area of fire grate	1144.4 ft.
I. H. P. per foot grate	18.85
Howden forced draft system	
Draft in asphit	2"
Expansion full gear	
2-77" = 1-109" L. P. cylinder	

Found in Old Ships.

The utilization of apparent waste is well exemplified in the breaking up of ships of various kinds, for every nail and every chip are put aside for sale; but in the case of vessels of considerable tonnage, and especially of very old craft, finds both curious and valuable are by no means rare. To give a recent instance, an old wooden vessel that was broken up near Greenwich, only a few months back, revealed a very curious sight when some old planking in the fore-castle had been torn down. Here, nailed up, were the two mummified hands of a negro, and in the palm of each hand, and transfixed by the same nails that help the hands, were two counterfeit silver dollars. The hands had been hecked off roughly. A year or two ago the breaking up of an old schooner near Sheerness brought to light beneath the inner skin of the hull quite an elaborate armament of a very old-fashioned kind, and a friend of the writer secured from among the many weapons included a splendidly made bell-mouthed flint-lock musket, the stock being marked with a representation of arm and leg fetters, and the name "Philip Steyne, Boston, Lincolnshire." The most curious part of this find was a set of books—a privateer's books evidently—showing the capture of various French vessels. Tied up in a canvas bag 190 guineas of gold were found a year or two back during the breaking up of an old vessel lying between Birkenhead and New Brighton. With the money were found, too, a most curious and unique set of foreign playing cards, some loaded dice, and three magnificent pieces of amber. All these were found in the false bottom of a wooden bunk.

But even during the breaking up of quite modern vessels, which have become wrecks, remarkable finds, particularly relating to smuggling contrivances, are by no means rare. In a portion of a considerable wreck on the south-east coast only the winter before last the ship breakers found, hidden in a part of the engine room, a quantity of valuable jewelry and a number of newspaper clippings, and published portraits relating to a murder and robbery at St. Louis, in the United States. The jewelry found was that described in the reports as missing. Two of the men employed in the engine room were drowned in the wreck, but, so far as all inquiries made by the police could show, there was no clue to attach either the drowned men or the other engine-room hands with the published description and portraits of the murderer. The mystery was never cleared up. The manager of a ship breaker, a man who has been for forty years in the business, and who was especially sought out by the writer, told the latter that he could cite some hundreds of cases where hiding places for small articles smuggled by officers and men had been found, these being in connection with nearly every part of the hulls broken up, and he produced several articles that had been found by himself or his men. Many of these were false or duplicate bills of lading, and there were counterfeit foreign coins, a pair of heavy gold earrings with turquois in each—probably stolen by one foreign seaman from another—a hand grenade with a cap to it, an old wig with three small gold nuggets wrapped in it and many other small trifles.

"At Rotherhithe, some years ago," said he, "in the forepeak of a very old wooden merchantman, we found the skeleton of a lad jammed behind the skin of a vessel. The lad had been a stowaway in all probability. A gentleman at Rotherhithe keeps the skull now, or did till lately."—English Magazine.

other like hawks. These are the first cards published from these new American liners, and they are especially interesting considering the record breaking time made by them recently.

We believe the data will show them to be the most economical engines of the kind in the world. The consumption of 1.22 pounds of coal per I. H. P. shows an economy that is not obtained in merchant service, and it is doubtful if the Campania can equal it. The cards are

Summer Outings.

Within a few days the Niagara Navigation Company will add its new steamer to the fleet of fast steamers running between Lewiston and Toronto. The regularity and number of trips make it as convenient as a ferry. Any one visiting Niagara Falls should not fail to run down to Lewiston on the Gorge road and take a ride to Toronto and return on these steamers, the service of which is not surpassed on the lakes.

Tourists certainly owe a debt of gratitude to the Quebec & Lake St. John Railway for opening up at an expense of \$6,000,000, such a wild stretch of scenery along its line of 190 miles. Anglers have built club houses along the road, and eastern capitalists and foreigners patronize it freely. It is used a great deal by parties taking the Saguenay trip, going up by rail and descending by steamer, which avoids the unpleasant feature of traversing the same route twice. A large hotel at Roberval and one at Grand Discharge on Lake St. John are headquarters for ouananiche angling. Write the company at Quebec for a panoramic guide.

Three of the very handsome steamers that traverse Lake Champlain and Lake George have paddle wheels, and those wheels in the Vermont and Horicon are propelled by some interesting engines, built by Fletcher & Harrison, now the W. & A. Fletcher Co., in 1871 and 1875. The service on the two lakes with its railroad connections is very complete, and forms an important link in the summer tourist

travel of the East. A great deal of the Adirondack travel goes that way, and all the important summer hotels on either one of these historical lakes are landing places. Particulars may be had by addressing the Champlain Transportation Company, Burlington, Vt.

Trade Notes.

A. H. Cummings, president of the Mason City, Iowa, board of education, writes the Buffalo Forge Co., that their heating and ventilating system gives satisfaction and is more economical than hot water or air.

W. Frank West, who was mechanical engineer with the Gas Engine and Power Co., and inventor of the West water-tube boiler, has bought a half interest in the yacht building business of Geo. H. Saunders, Bristol, R. I. He was with the Herreshoffs ten years. The new company will build shops at once.

The Almy Water Tube Boiler Co., have supplied the following steam yachts since the last cruise of the New York yacht club: Gretchen, John E. Reyburn; Arcturus, Rutherford Stuyvesant; Parthenia, John B. Roach; Giralda, E. S. Renwick; Indolent, J. C. Rhodes; Illawarra, Eugene Tomkins; Corsette, C. A. Tatum; Vesta, Henry A. Laughlin; Orienta, E. R. Ladew; Magnet, Thomas A. Howell; Valina, William H. Post; Chepeta, C. W. Wharton; Iduna, F. A. Foster; Marion, N. Witherell; Kalolah, C. L. Hubbard; Ardath, J. A. Aspinwall; Aida, W. T. Douglas. This shows how well the Almy boiler is appreciated by yachtsmen.

NORTH
WEST



FROM
CLEVELAND to BUFFALO and Eastern Resorts
MONDAYS and THURSDAYS, 12 o'clock night.

TO
Detroit, Mackinac, Soo, Duluth and West
WEDNESDAYS and SATURDAYS, 7:30 A.M.

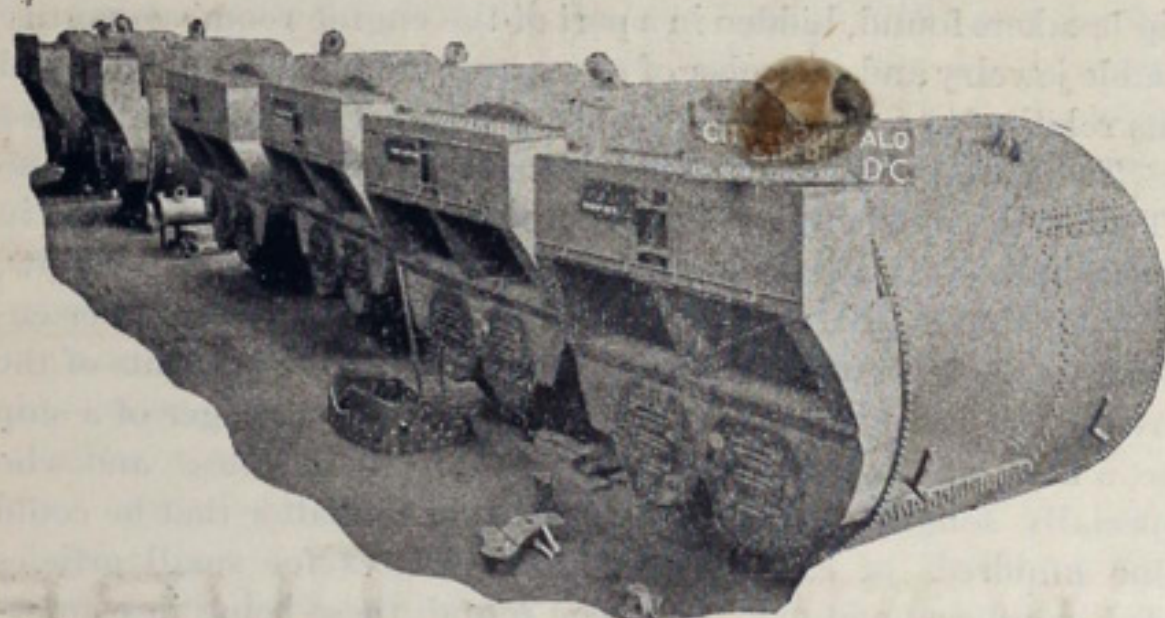
D. J. COLLVER, 239 Superior St. | NEW DOCK, Foot of Water St. | C. H. TUCKER, 23 River St.



NORTH
LAND

Air is Cheap—Cheaper than Dirt!

FUEL IS DEAR—VERY DEAR! USE AIR AND SAVE FUEL!



Six Boilers with Howden Hot Draft appliances now in Side-Wheel Steamer City of Buffalo. Dimensions of each boiler—12 ft. 6 in. diameter by 12 ft. length.

ECONOMY in operating expenses on Lake Ships must come from reduced coal bills. No great saving can be made in labor cost, and provisions are already low. But fuel bills can be lowered and cheap coal used to advantage by adopting Modern Methods of making steam at low cost.

No manufacturer of pig iron would to-day think of running his furnace without a hot blast. Competition would not permit it. This same competition demands advanced practice in the operation of ships. The same principle is applied in the

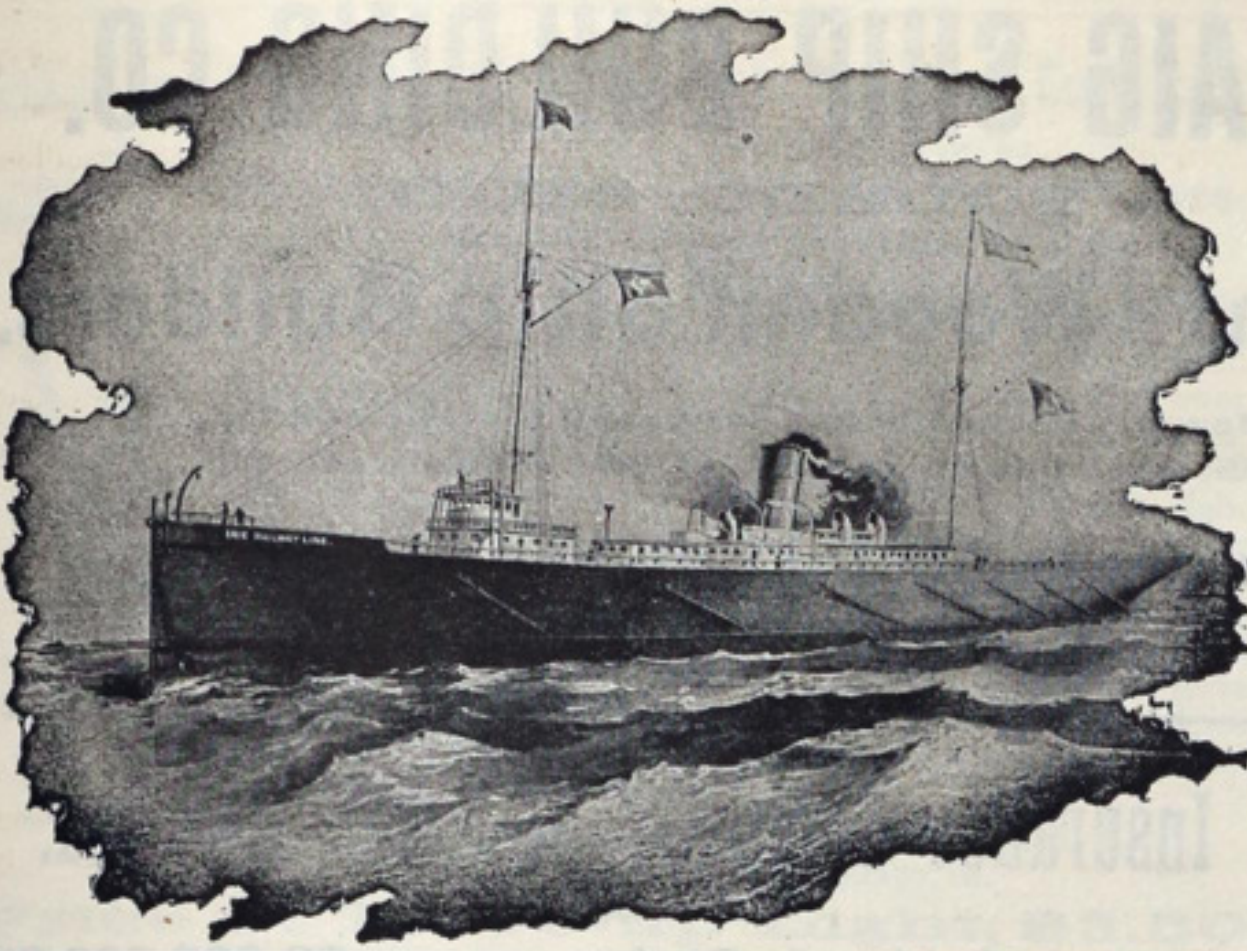
HOWDEN HOT DRAFT

Now in use on Lake Steamers aggregating over 40,000 Horse Power.

CAN BE APPLIED TO OLD SHIPS AS WELL AS NEW ONES.

No complicated machinery. Cool engine rooms and cool fire holds. Estimates readily furnished for application of this draft to any steamer.

DRY DOCK ENGINE WORKS, DETROIT, MICH.



Rapid Fueling Docks, DETROIT RIVER.

JAMES GRAHAM, Foot Twenty-first St., Detroit,
Below Routes of Passenger and Car
Ferry Lines.

Pockets and Chutes arranged for different types of vessels.

BEST STEAM COAL.

Large Supplies and every effort to give dispatch, day and night. Wide stretch of river for tows, and plenty of water at dock at all times.



Keeping a sharp look-out for
Shipman's Coal Dock.

GIVE US a chance to prove that we can coal your boats with quick dispatch, and with most satisfactory fuel.

We have Four Large CHUTES on our Docks at AMHERSTBURG, ONTARIO,
1,000 FEET RIVER FRONT and Day and Night Force.

OUR STOCK CONSISTS OF

**"Keystone" Massillon, Youghioghenny,
and Best Grades of Hocking Koals.**

O. W. SHIPMAN, MAIN OFFICE,
90 Griswold St., Detroit, Mich.

Cuddy-Mullen Coal Co. Lake Shippers of Steam Coal.

FUELING DEPARTMENT FACILITIES:

CLEVELAND HARBOR—

Car Dumper; Eight Pockets; Three Steam
Derricks; Lighter.

DETROIT RIVER BRANCH—

Amherstburg, Steam Derricks; Sandwich,
Ten Pockets and Two Steam Derricks.

SAULT RIVER BRANCH—

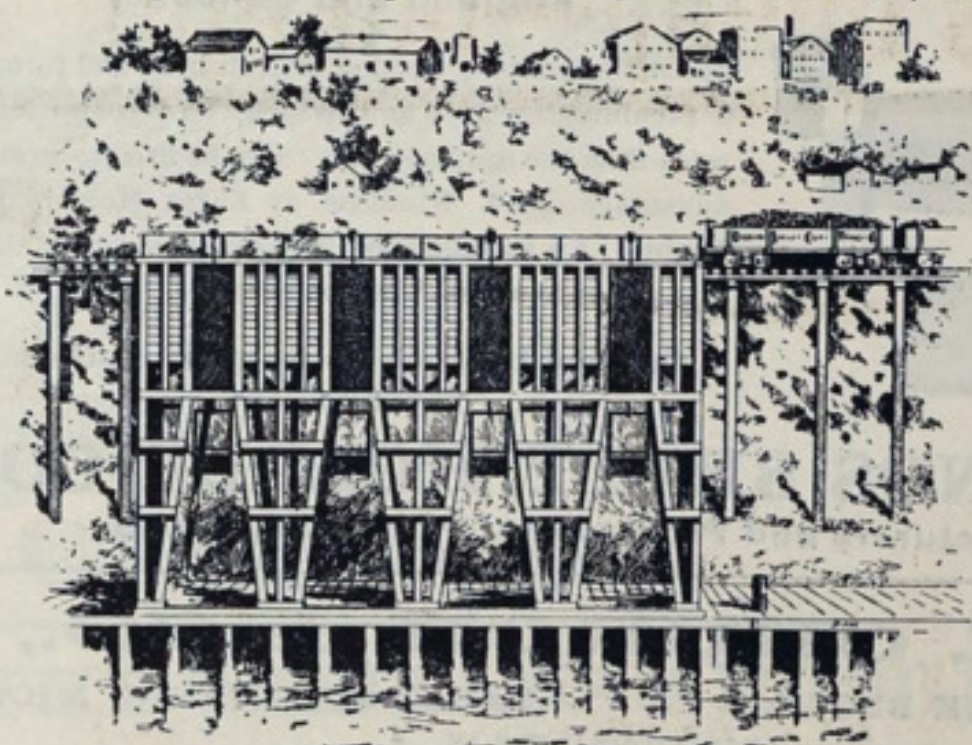
Pocket Dock now under construction.

Good Coal; Courteous Attention; Quick Dispatch.

General Offices: Perry-Payne Bldg., Cleveland, O.

FUEL DOCKS OF OSBORNE, SAEGER & CO.

Cuyahoga River, just above Superior St. Viaduct, Cleveland, O.



Best
Youghioghenny
Steam Coal
Furnished
Day or Night.
No delay as
Elevated
Pockets are used.

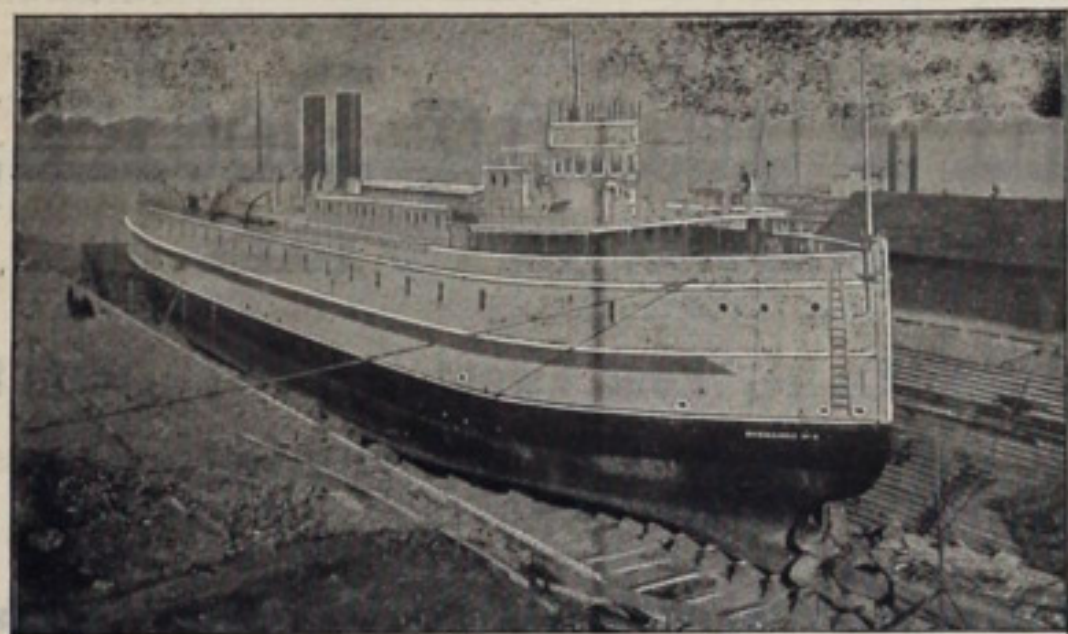
THE BABCOCK & WILCOX CO. FORGED STEEL WATER-TUBE MARINE BOILER,

29 CORTLANDT ST., NEW YORK.

Boilers sold to United States Merchant Marine and Yachts - - - - - 16,500 H. P.

Boilers sold to United States Navy - - - - - 7,500 "

The only Water-tube Boiler in the British Merchant Marine 15,500 "



Shenango No. 2, 300 feet long, 51 feet beam.

CRAIG SHIP BUILDING CO.

TOLEDO, OHIO,

Metal & Wooden Ship Builders.

New Dry Dock—450 feet long, 110 feet wide on top,
55 feet wide on bottom, 16 feet of Water on Sill.

**Repairs to Metal and Wooden Ships
A Specialty.**

INCORPORATED 1794.

Insurance Company of North America.

CAPITAL, Paid up in Cash, - - - \$3,000,000.00
ASSETS, . - - - - - 9,487,673.53

CHARLES PLATT, President.

EUGENE L. ELLISON, 2nd Vice-President.

JOHN H. ATWOOD, Assistant Secretary.

WILLIAM A. PLATT, Vice-President.

GREVILLE E. FRYER, Sec'y. & Treas.

Lake Marine Department.

GEORGE L. McCURDY, Manager.
CHICAGO, ILLS.

Gas Engine & Power Co.

MORRIS HEIGHTS, NEW YORK CITY.



SOLE MANUFACTURERS OF

The Only Naphtha Launch.

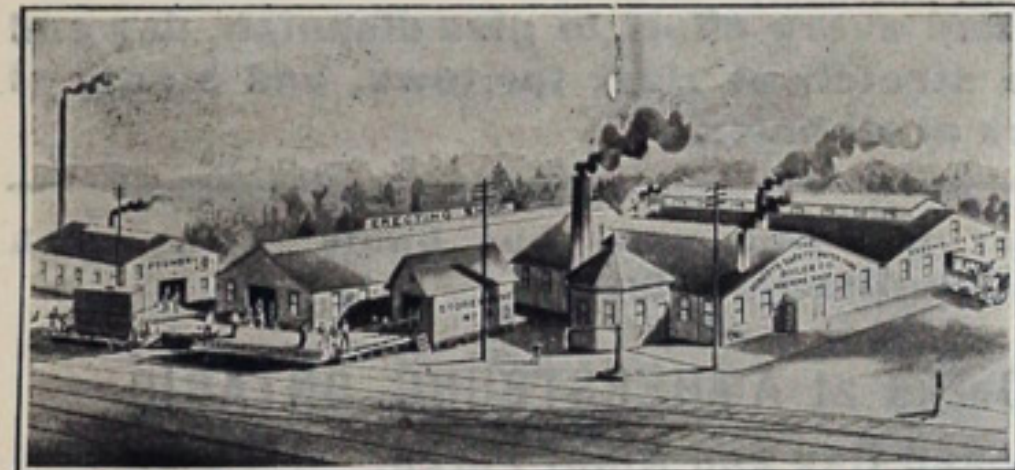
ALSO BUILDERS OF

High Class Steam Yachts and Electric Launches.

Send 10 cent stamp for Catalogue.

Captains will find some 75 or 100 pages of the Blue Book of American Shipping devoted to their interests. Write to the MARINE REVIEW, Cleveland, for reasonable terms upon which the book may be obtained by men aboard vessels.

"Far better than anything ever published in the same line" is the general verdict on the Blue Book of American Shipping. Price \$5. Order from MARINE REVIEW, Cleveland.



Chicago, Jan. 13, 1896.

THE ROBERTS BOILER CO.

Gentlemen: I cannot see but that the boiler in the "Mamie C" is just as good as it ever was, even if it is 17 years old. I had no complaint from it last summer.

Yours truly,
A. E. CLARK.

THE ROBERTS BOILER is the Cheapest, Best and Lasts Longest
Adapted for use in Yachts, Launches, and Vessels of all Kinds.

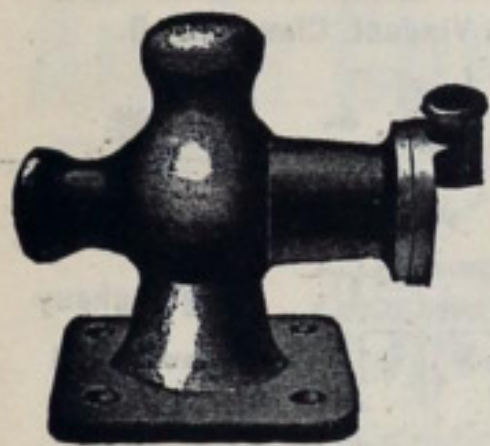
Handsome Illustrated Circular sent free on application to

The Roberts Safety Water Tube Boiler Co.,
WORKS, RED BANK, N. J. 39 & 41 Cortlandt St., NEW YORK.

PROPOSALS FOR IMPROVING ERIE HARBOR, Pa., U. S. Engineer office, D. S. Morgan Building, Buffalo, N. Y., June 19, 1896. Sealed proposals for dredging, and furnishing and placing rip-rap stone at Erie Harbor, Pa., will be received here until 11 o'clock A. M., July 20, 1896, and then publicly opened. Information furnished on application. T. W. SYMONS, Major, Engrs. July 18.

Enos Combined Bitt, Winch and Sheet Holder.

**Patented in the United States,
England and Canada.**



Takes the place of wooden or iron bitts and forms a Combination Bitt and Winch. Takes up less room than the ordinary bitt. Can be used to great advantage as a Windlass or Sheet Holder on Yachts. An examination will convince you of the many uses to which it can be put.

Carried in stock by Ship Chandlers everywhere.

THE ENOS SHEET HOLDER CO.
Manufacturers and Proprietors, PEABODY, MASS.

P. M. CHURCH & CO.,
SAVINGS BANK BLOCK, SAULT STE. MARIE, MICH.
LEADING DEALERS IN

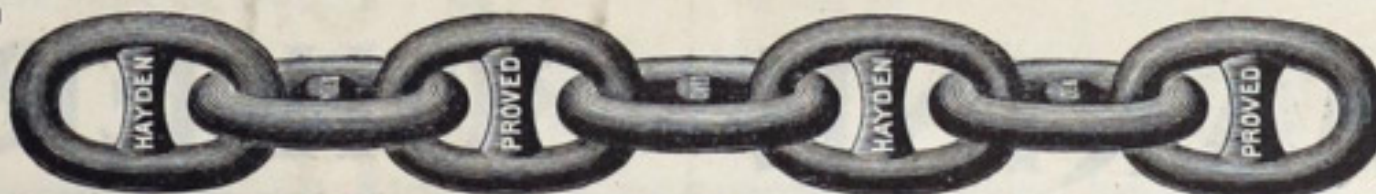
Ship Chandlery,

Marine Hardware, Paints, Oils, Packings, Cordage, Etc.
FIRST-CLASS COPPERSMITH AND TINSHOP IN CONNECTION.

Chain Department * P. HAYDEN S. H. CO. * Columbus, Ohio.

Our Chain in use on the Largest Steamers on the Lakes:

**The Zenith City, Victory,
North West and North Land,
and many others.**



**All kinds of Chain—
Stud and Close Link,
Cable Chains.**
Write for Prices.

AMERICAN SHIP WINDLASS CO. P. O. BOX 53, PROVIDENCE, R. I.

BUILDERS OF THE

"Providence" Windlasses and Capstans

350 STYLES AND SIZES.
OVER 5000 IN USE.

SEND FOR CATALOGUE.

FRANK S. MANTON, AGENT.

GRAHAM-MEYER TORCH and LIQUID LIGHT COMPANY

89 Fulton St., Boston, Mass.

MANUFACTURERS OF

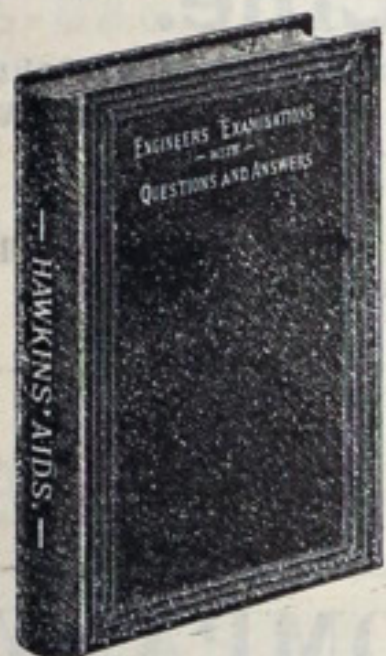
**Torches and Liquids for Lights of Various Colors,
For Signal Lights and Illuminations of all kinds.
Blue Flash Lights a Specialty.**



We call the attention of masters of vessels to the efficiency of our patented flare-up or flash light torch. It can be used with kerosene or spirits of turpentine. Its superiority over all other kinds of torches is that it is indestructible. Being filled with asbestos, it will last for years, and is ready for use at any moment. It gives a white flame three to five feet high, burns less liquid than any ordinary torch of the same size or larger. The combustion is so perfect that very little smoke is made, and the flame is therefore much brighter. At night you can wigwag with this torch. Rain or spray will not extinguish it, and the stronger the wind the better it burns. We have also a **Blue, Green and Red Burning Liquid**, to make any code of signals required. Yachtsmen will find this of immense value for signaling.

Lake Agents: { The Upson-Walton Co., Cleveland, O.
H. Channon Co., Chicago, Ill.

Price of Flare-up Light, \$3.50



"Engineers' Examinations"

With Questions and Answers.

Printed on heavy paper and bound in red leather.

Any young engineer, greaser or fireman ought to have it.

Sent postpaid to any address, on receipt of \$2.00.

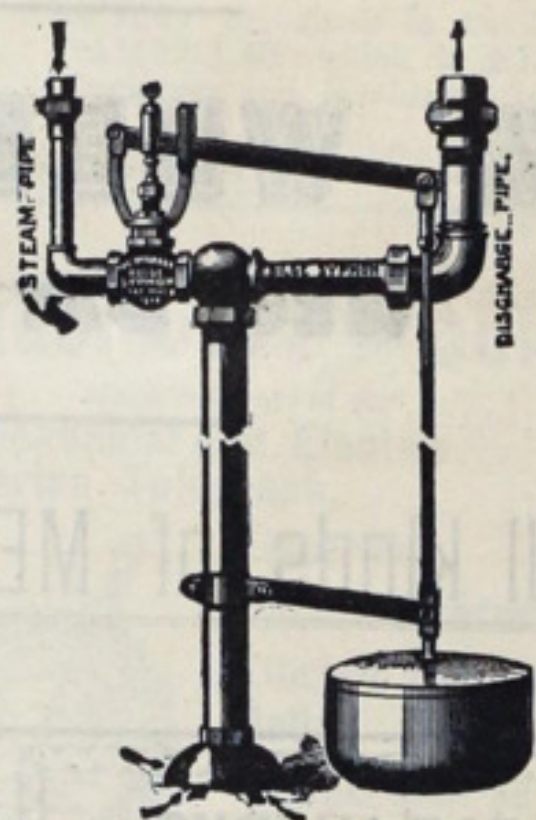
MARINE REVIEW,

410 Perry-Payne Bldg.,
Cleveland, O.

The list of American and Canadian vessels, with length and beam, and name and address of managing owner, is up to date, and correct in the Blue Book of American Shipping. Send \$5 for it to the MARINE REVIEW, Cleveland.

THE BRAENDER AUTOMATIC BILGE SYPHON,

Always on Watch
"SHIP AHOY."



It never tires, or goes to sleep, and is reliable at all times.

It is the best, cheapest and surest way of keeping your vessel dry.

They are indorsed by leading Engineers throughout the country.

They commend themselves wherever placed. A dry bottom in ship's holds gains speed, which is equal to money.

By giving it a trial, it will speak for itself. Write for circular,

PHILIP BRAENDER,
261 West 118th Street, • NEW YORK.



COLUMBIA MFG. CO.

Manufacturers of

METAL POLISH, * BUFFING COMPOSITIONS.

A great labor saver.
Especially adapted for Marine Engines.
1 lb. tin boxes, 45 cents; 5 lb. pails, \$1.50.

94 Holmden Ave., CLEVELAND, O.

John Thompson, 123 River St., Agent, Cleveland, O.



FUELING DOCKS:
NORTH PIER
18th STREET BRIDGE,
ILLINOIS CENTRAL SLIP "C"

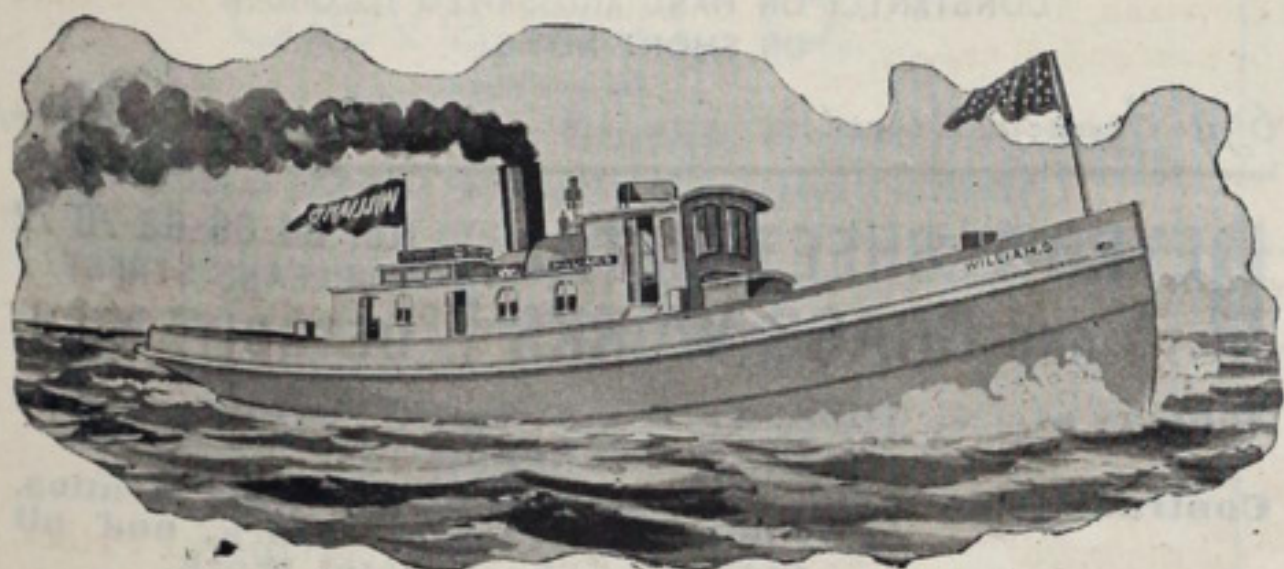
STORAGE DOCKS FOR ANTHRACITE:
KINGSBURY ST. BETWEEN INDIANA & ERIE STS.
ELSTON AVE. DIVISION ST. BRIDGE (NORTH BRANCH)
NORTH AVE. BRIDGE.
DIVISION ST. BRIDGE (OGDEN CANAL)
SOUTH HALSTED ST. BRIDGE.

OFFICE,
225 DEARBORN ST.

CHICAGO.

C. E. GROVER, Prest.
D. R. HANNA, V. Prest.

W. A. COLLIER, Sec. & Sreas.
CAPT. PHILIP SHIED, Marine Supt.



The Ashtabula Tug Co. Main St. Bridge,
INCORPORATED. W. A. COLLIER, Gen. Mgr. CLEVELAND, O.
CLEVELAND, Tel. 409. ASHTABULA, Tel. 149.

JOHN HAUG, Consulting Engineer and Naval Architect.

Ship and Engineer Surveyor Lloyds Register, London. 206 Walnut
Plans, Specifications and Superintendence of Ships and their Machinery. Place,
Specialties—Bulk Oil Vessels High Speed Yacht Engines, etc. Philadelphia.

THE WILLIAMS & RODGERS CO.

SUPERIOR and SENECA STREETS.

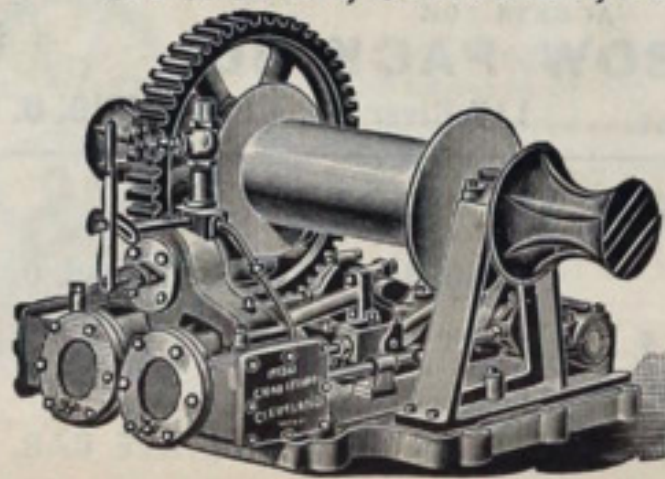
BOAT SUPPLIES

We make special rates to vessel owners on Dry Goods, Bedding,
Floor Coverings, Furniture, Kitchen Utensils, etc.

THE WILLIAMS & RODGERS CO., CLEVELAND, O.

The Chase Machine Co.

111 Elm St., Cleveland, O.



**MACHINISTS
and ENGINEERS**

MANUFACTURERS OF
Land and Marine Engines
and Steam Pumps.

SOLE OWNERS AND MANUFACTURERS OF
Chase Fog Whistle Machine.

Over 150 in use on the best class
of Lake Steamers.

Special Attention given to
MARINE REPAIR WORK.

Engineers' Supplies.
Asbestos Pipe and Boiler Covering.
TELEPHONE 994.

F. W. WHEELER,
President.

E. T. CARRINGTON,
Vice-President.

C. W. STIVER,
Secy. and Treas.

F. W. WHEELER & CO.,

WEST BAY CITY, MICH.

Builders of all kinds of METAL AND WOODEN SHIPS.

AMERICAN CHAIN CABLE WORKS.

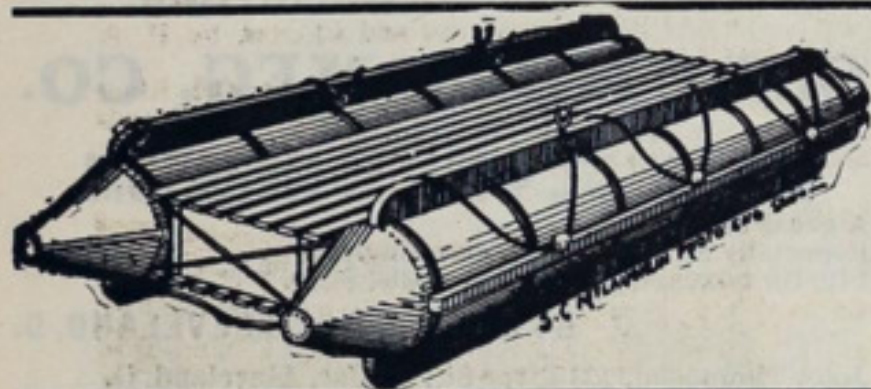
ESTABLISHED 1865.

Cable, Dredge, Quarry, Shipping, Crane and Rafting

CHAINS.

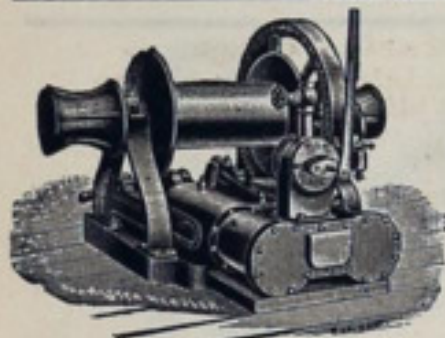
Our Dredge and Crane Chains are made of Iron Rolled Specially for that purpose in three qualities, "Burden's," "H. B. & I." iron, and "Burden's Best Best" iron.

THE J. B. CARR COMPANY, TROY, NEW YORK.



Thos. Drein & Son,
BUILDERS OF

Metallic Life Boats and Rafts,
Government and Pleasure
Boats. Block and Granulated
Cork Life Preservers. Outfit
for Lake Steamers a Specialty.
TATNALL & RAILROAD STS.
Wilmington, Del.



DOCK and DECK HOISTS
ALL KINDS OF
Machinery & Friction Hoists.

SEND FOR PRICES AND CIRCULARS.

JACKSON & CHURCH,
SAGINAW, MICH.

THE "CINCINNATI"
AUTOMATIC
STEAM STEERING GEAR
A Simple, Powerful Machine. Noiseless and Sure.
SEND FOR CIRCULAR.
FRONTIER IRON WORKS,
DETROIT, MICH.

HOWARD H. BAKER & Co.
Ship Chandlers and Sail Makers,
18 to 26 Terrace. — BUFFALO, N.Y.



H. E. STEVENS. TOM MEAD. LEW PRESLEY
BUCKEYE STEAM FITTING CO.
Steam Fitters, Engineers Supplies,
Phone 4058, AGENTS FOR
RAINBOW PACKING.
Open Day and Night. 117 River St., CLEVELAND, O.

CAPT. SAMUEL W. GOULD,

Ex-Ass't Inspector of Steam Vessels,

265 Marcy Ave., Cleveland, O.

Gives Instructions in Navigation and prepares Candidates for the Examinations, for Master and Pilots Licenses, before the Local Steamboat Inspectors.

Also Instructions given in the Safety Valve and other Problems required by Candidates for Engineers License.

TERMS REASONABLE.

TAKE WADE PARK OR PAYNE AVE CAR.

B. B. INMAN, Manager.

H. G. INMAN, Sec'y and Treas.

Inman Tug Line.

Office on N. P. Dock, Open Day and Night.

TELEPHONE 146.

DULUTH, MINN.

Finest outfit at the head of the lakes for log towing.

TUGS.

M. D. Carrington
E. T. Carrington
J. L. Williams
Bob Anderson
Joe D. Dudley
W. B. Castle

L. L. Lyon
F. H. Stanwood
Buffalo
Record
Effe L.
Edward Fiske

P. B. Campbell
Pathfinder
A. C. Adams
Mystic
Lida

Tugs, Hawesers, Steam Pumps, Lighters and Divers Furnished on Short Notice. Also owners of Steamer Belle Cross and Schooner Clement and Chicago Board of Trade. Three 12-inch Am. Fire Engine Company's Wrecking Pumps, and one 12-inch Worthington Pump.

H. CHANNON COMPANY

Ship Chandlers and Sail Makers.



AGENTS FOR
RYLANDS BROS.

MANUFACTURERS OF
ENGLISH GALVANIZED STEEL HAWSERS,
24-26 Market Street, CHICAGO, ILL.

The Martin-Barriss Co.

IMPORTERS AND MANUFACTURERS OF

Mahogany, White Mahogany,

AND ALL NATIVE CABINET WOODS.

HIGH GRADES OF KILN DRIED WOODS FOR
CABIN WORK AND INSIDE TRIM.

White Oak Timbers and Plank

CONSTANTLY ON HAND AND SAWED TO ORDER
ON SHORT NOTICE.

654 Seneca Street,

Cleveland, Ohio.

DETROIT SHEET METAL } No. 64-66-68-70-72
AND BRASS WORKS } ORLEANS STREET,
DETROIT, MICH.

Jobbers of..... Pipe, Valves, Fittings. Packing, Oil and
Engineers Supplies.

Contractors for High Class Steam Fitting, Steam Heating,
Plumbing, Copper Work, and all
Classes of Sheet Metal Work.

Manufacturers of Clark's Patent Metallic Life Raft, Side
Lights, Marine Hardware, Hurricane,
Cabin and Platform Lamps, Trip
Gongs, etc.

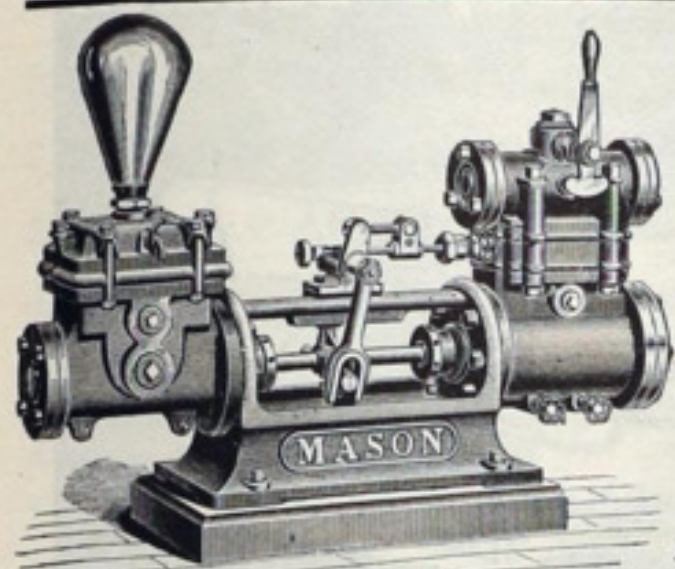
Agents for..... Laidlaw - Dunn - Gordon Steam Pumps,
Warren Webster's Specialties, and
Buffalo Forge Co.'s Fans, Engines and
Heaters.

Engineers can be waited on promptly day or night.

DIXON'S Graphite Pipe Joint Compound

Enables you to MAKE A TIGHTER JOINT than you can possibly make with red lead. You can do it easier, and parts can be separated at any time without breaking anything. Send for sample and circular.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

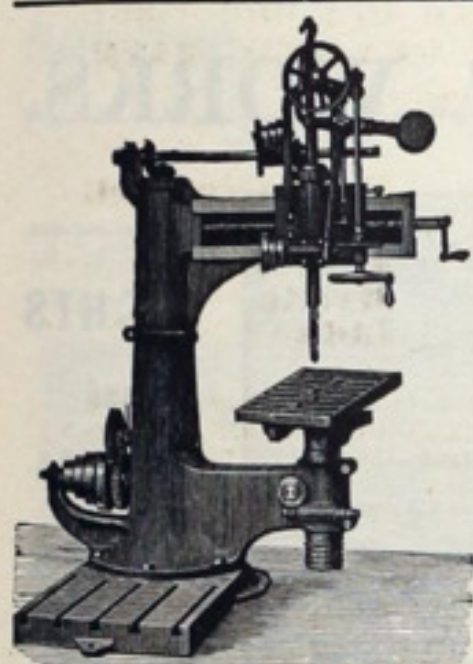
**The Mason Steam Pump.**

"IT CAN'T HANG UP"

Reducing Valves,
Pump Governors,
and Speed Regulators.

Adopted by U. S. Navy.

THE MASON REGULATOR CO., BOSTON, MASS.

**Bement, Miles & Company,**

PHILADELPHIA, PA.

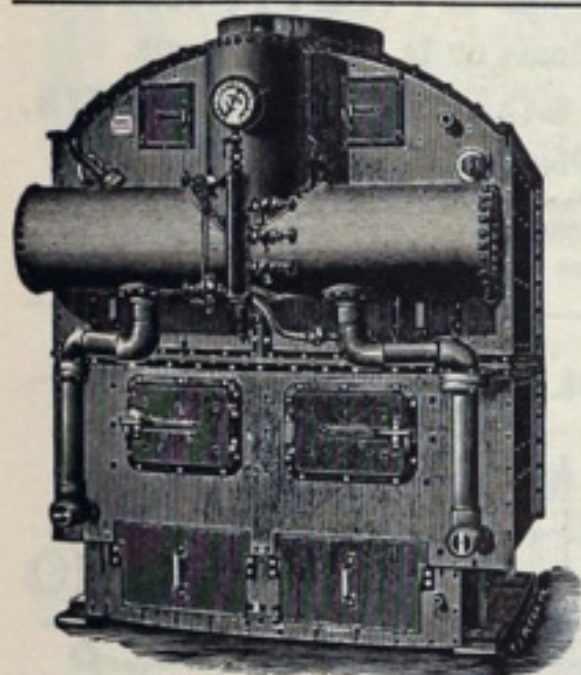
MANUFACTURERS OF

Metal Working Machine Tools

For Ship Yards, Railroad Shops,
Locomotive and Car Builders,
Machine Shops, Rolling Mills,
Steam Forges, Boiler Shops,
Bridge Works, etc., etc.

Steam Hammers, Steam and
Hydraulic Riveting Machines.

New York Office: Taylor Bldg. No. 39 Cortlandt St.
Chicago Office: 1534 Marquette Building.

**ALMY'S PATENT
SECTIONAL
Water-Tube Boilers.**

NOW USED IN

18 Passenger Boats from 70 to 160 feet long.

27 Steam Yachts from 50 to 160 feet long.

U. S. Torpedo Boat "Stiletto."

Numerous Small Launches and Stationary
Boilers are giving most excellent results.

ALMY WATER-TUBE BOILER CO.,

No. 178-184 Allens Avenue,
near Rhodes St.
PROVIDENCE, R. I.

1880.

1896.

**CHAS. H. POTTER & CO.,
Investment Bankers,
Cleveland, O.**

Dealers in

Lake Superior Iron Mining Stocks, Municipal, Water
Works and Street Railway Company Bonds.

We buy and sell for cash all securities listed on the New York, Boston,
Chicago, Philadelphia, Cincinnati and Pittsburg stock exchanges.

UNITED STATES ENGINEER OFFICE, 366
Milwaukee street, Milwaukee, Wis., Aug.
1, 1896. Sealed Proposals for dredging at
harbors: Oconto, 37,000 cubic yards; Two Rivers,
30,000 cubic yards; Milwaukee, 12,000 cubic
yards; Racine, 25,000 cubic yards; Kenosha, 45,
000 cubic yards, will be received here until 12
o'clock noon August 20, 1896, and then publicly
opened. Information furnished on application.
GEORGE A. ZINN, Capt. Engrs. Aug. 6-13

Paint your
Vessels with

Superior Graphite Paint.

NO BLISTERING, CRACKING OR SCALING.

Made especially for Stacks, Decks, Sides, Hulls and Water Com-
partments. Strictly anti-rust, and most durable
and economical.

DETROIT GRAPHITE MFG. CO., 541 River St., Detroit, Mich.

DIXON'S Lubricating Graphite

Is fully explained in an INTERESTING AND INSTRUCTIVE
PAMPHLET which is FREE to all interested. It will pay all
Engineers and Machinists to SEND FOR IT.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

Chas. Corv & Son

Manufacturers of the
Mechanical and Electric
Marine Telegraph,



Electrical
Helm Indicators
Electric Call
Bells.

Engine Bells and
Brass Work of
all descriptions,
Shrieking and
Siren Whistles.

278 DIVISION ST.,
NEW YORK CITY.

Alfred B. Sands & Son**Yacht Plumbers.**

MANUFACTURERS OF
YACHT PLUMBING SPECIALTIES.

Pump Water Closets, for above or below
water line.

Folding Lavatories, Ventilators, Pumps,
Deck Plates, Etc.

134 Beekman St., NEW YORK.

NEVERSINK CORK JACKET AND LIFE BELT.

Warranted 24 lb. Buoyancy and full Weight of Cork, as required by U. S. Inspectors.
Consolidated Cork Life Preservers. Superior to all others. Ring Buoys and Fenders.

SAFEST, CHEAPEST. Approved and adopted by U. S.
Board of Supervising Inspectors.

Also adopted by the principal Ocean, Lake and River
Steamer Lines as the only Reliable Life Preserver. Vessels
and the trade supplied. Send for catalogue.

Awarded four Medals by World's Columbian Exposition



Metallic
and
Wooden
Life
Boats.

**Metallic Life Rafts, Marine Drags.**

Manufacturer of Woolsey's Patent Life Buoy, which is the
lightest, cheapest and most compact Life Raft known.

Send for Illustrated Catalogue.

Get our prices before buying elsewhere.

D. KAHNWEILER,

437 Pearl Street, NEW YORK CITY.



PRESSURE
REGULATOR No. 2

**The "DAVIS" Pressure Regulator
and Reducing Valve.**

Is the simplest and best for reducing the pressure to
Steam Steering Engines, Donkey Engines, Steam
Winches and all places requiring a uniform pressure
below that of boilers.

No diaphragms, spring or packing.

Cut shows scale weights. We can furnish lever and
sliding ball weight if preferred.

MANUFACTURED BY

G. M. DAVIS & CO.

106 N. Clinton St., CHICAGO, ILL.

FOR SALE BY

R. E. Hills, Chicago. U. H. McCutcheon, Buffalo

Geo. Worthington Co., Cleveland.

P. M. Church, Sault Ste. Marie. Jas. Walker & Son, Detroit

Jas. Clements & Son, Bay City, Mich.

Cleveland Ship Building Co., Cleveland.

Chicago Ship Building Co., Chicago.

Selling agents—The McIntosh-Huntington Co., Cleveland, O.; The Detroit Sheet Metal
and Brass Works, Detroit, Mich.

SHERIFFS STEAM STEERER.

MADE IN TWO SIZES.

Are easy to adjust and can
be handled by any one.

The Steerer can be arranged
to set in pilot house or aft.

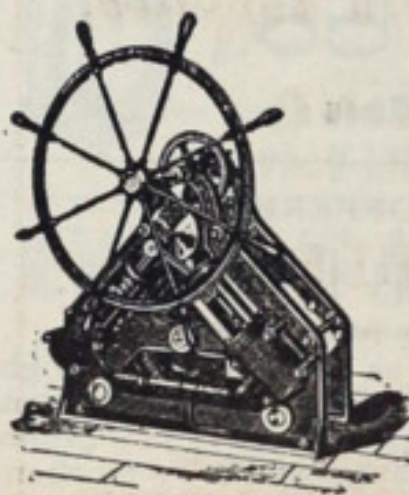
No Steerer will be sold with-
out a quadrant.

Steerer will be sold on ap-
proval.

Manufactured by

SHERIFFS MFG. CO.

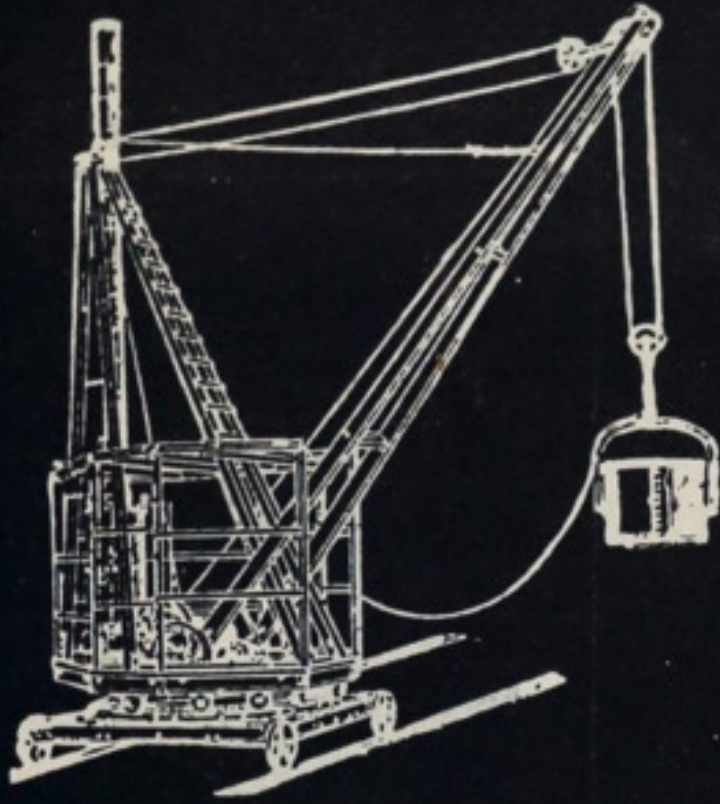
126-130 Barclay Street,
MILWAUKEE, WIS.



McMYLER MANUFACTURING CO., 180 COLUMBUS STREET, CLEVELAND, O.

SOLE MAKERS OF THE

McMYLER PATENT REVOLVING STEAM DERRICK

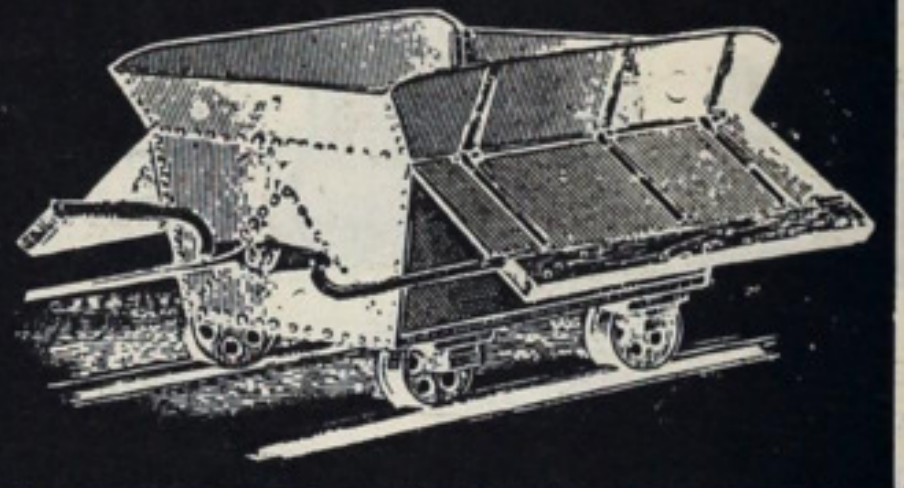


FOR HANDLING COAL, ORE AND COARSE FREIGHT OF ANY DESCRIPTION.

This Derrick can Lift Load, Alter the Radius of Boom, Swing in Either Direction at Will of Operator, and can Propel Itself on Track any Desired Distance.

BUILT FOR ANY CAPACITY WANTED

BUILDERS OF
CONVEYORS, COAL BUCKETS, ORE
BUCKETS AND DUMP CARS.



"IMPROVEMENT THE ORDER OF THE AGE."

IF YOU DESIRE TO LEARN

Respecting the merits of the THREE NEW MODELS, Nos. 2, 3 and 4, SMITH PREMIER TYPEWRITERS, drop us a line. They embody the Most Progressive Mechanical Principles, and are "up-to-date" in every respect.

The Smith-Premier Typewriter Co.

348 Superior Street, City Hall Building, CLEVELAND, OHIO.
Competent Operators Furnished. TELEPHONE 339.

FOR SALE CHEAP

Excursion Steamer

"CORONA"

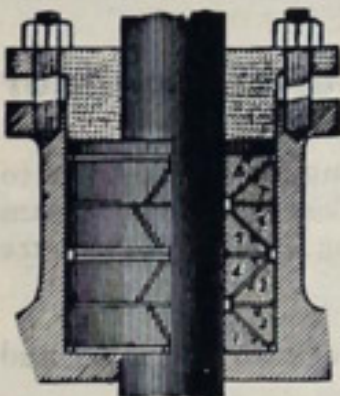
Capacity 1100 Passengers.

(Day Boat.)

FOR FULL INFORMATION APPLY TO

WOODLAWN BEACH CO., 27 Lewis Bldg., BUFFALO, N.Y.

KATZENSTEIN'S Self-Acting METAL PACKING,



For PISTON RODS, VALVE STEMS, etc., of every description, for Steam Engines, Pumps, etc., etc.

Adopted and in use by the principal Iron Works and Steamship Companies, within the last twelve years, in this and foreign countries.

FLEXIBLE TUBULAR METALLIC PACKING, for slip-joints on Steam Pipes, and for Hydraulic Pressure; also METAL GASKETS for all kinds of flanges and joints.

DOUBLE-ACTING BALANCED WATER-TIGHT BULKHEAD DOORS for Steamers. Also Agents for the McColl-Cumming PATENT LIQUID RUDDER BRAKE. For full particulars and reference, address:

L. KATZENSTEIN & CO.,

General Machinists, Brass Finishers, Engineers' Supplies,
357 West St., New York.



SHIP LAMPS.

OIL AND ELECTRIC FIXTURES

FOR

Steamships, Yachts, &c.

GREAT VARIETY OF DESIGNS.

Prices and Cuts on Application.



PAGE BROS. & CO.,

347 to 357 Cambridge St. Boston, Mass



WHEN YOU ARE OFFERED

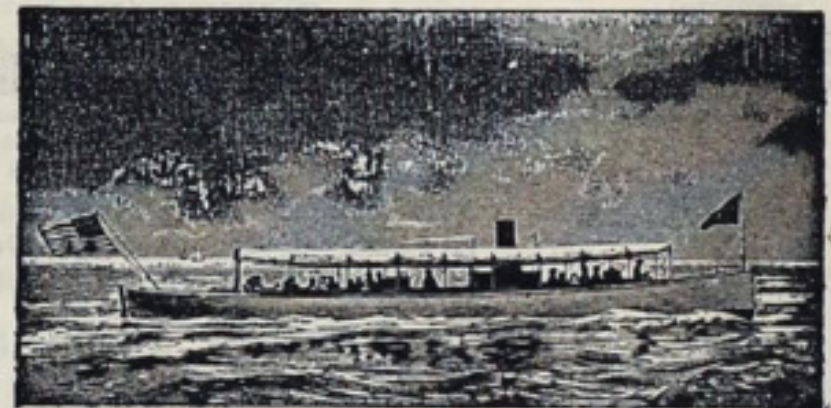
Jenkins' or Jenkins Bros.' Discs

that have Trade Mark same as cut, they are all right for high pressure steam. All others are imitations and you cannot hold us responsible. If you cannot get our discs from your dealer, send to us for them.

ENKINS BROS., 71 John St., N.Y.; 61 N. Canal St., Chicago; 117 N. 4th St., Phil'a; 105 Milk St., Boston.

DETROIT BOAT WORKS.

STEEL
and
WOODEN



YACHTS
and
LAUNCHES.

BUILDERS OF
ELECTRIC LAUNCHES, DETROIT, MICH.

Any Class Wooden, Iron or Steel Boats up to 150 ft. in length.

YAWLS. METALLIC LIFE BOATS. LIFE RAFTS.

All kinds of Small Pleasure Boats.

The electric launches used on the lagoons at World's Fair were manufactured by this company.

Send for new illustrated Catalogue of electric launches.

For special prices on DEADLIGHTS, write

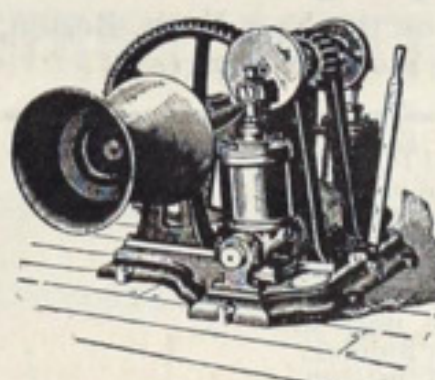
THE MARINE MANFG. AND SUPPLY CO.
158 SOUTH ST.
SHIP MACHINERY, YACHT FIXTURES
STEAMSHIP ENGINEERS & CONTRACTORS
SUPPLIES, ANCHORS, CHAINS, OAKUM,
TOYS, CORDAGE, WIRE ROPE, ETC.
NEW YORK, N. Y.

MIERS CORYELL

Consulting Mechanical Engineer,

21 E. 21st Street, NEW YORK.

Plans, Specifications and Superintendence. Marine and Water Works Engines and Boilers.



Hoisting Engines.

We build them in all sizes from new and improved designs. Every engine thoroughly tested before leaving our shop, and guaranteed to be satisfactory in every case. When in want of a Hoist for marine work, dock work, mining or any other purpose, kindly permit us to name you prices. We know we can please you.

Marine Iron Co., Bay City, Michigan.

JEFFERY'S
MARINE
CLUE

Can be obtained from the following well-known firms:

L. W. Ferdinand & Co.	Boston, Mass.
Howard H. Baker & Co.	Buffalo, N.Y.
Geo. B. Carpenter & Co.	Chicago, Ill.
H. D. Edwards & Co.	Detroit, Mich.
Upson-Walton Co.	Cleveland, Ohio.
M. I. Wilcox Cordage & Supply Co.	Toledo, Ohio.

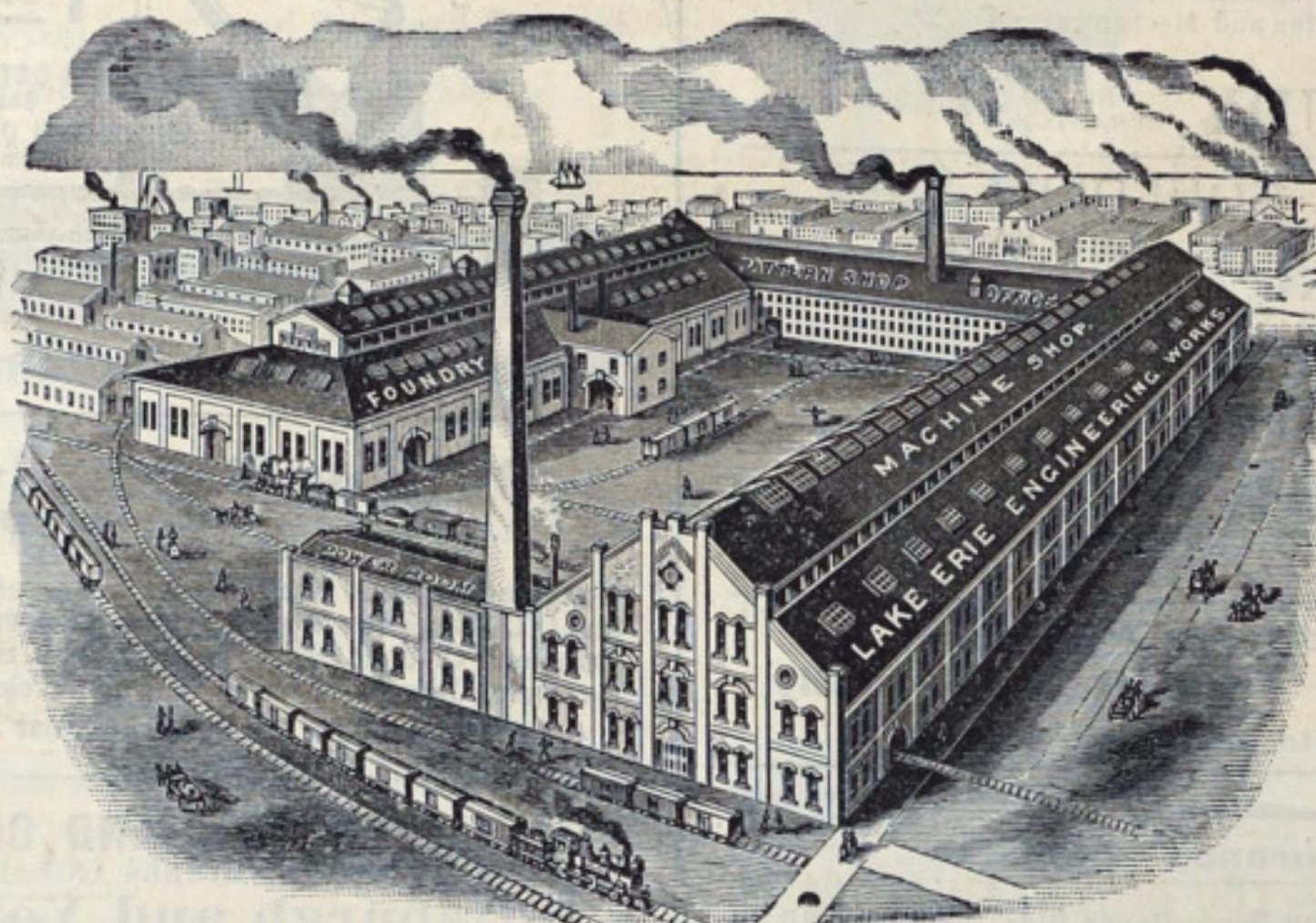
Send for Samples and Circulars.

Lake Erie Engineering Works, Buffalo, N. Y.

RICHARD HAMMOND, Pres't.

JOHN COON, Sec'y and Treas.

Steam Engines,
Compound, Triple
and Quadruple
Engines,
From 250 to 10,000
Horse Power
For Marine and
Stationary
Service.



Special Designs
for Cable
Railways and
Electric Power
Plants.

The Best Economy
and Regulation
Guaranteed.

THE BEST EQUIPPED PLANT IN AMERICA.



Nickel Plate Ahoy? Aye, Aye Sir!
The line to hail and the line to take
To reach your craft to fit her out,
Is the well-known, ship-shape Nickel Plate Route.
Chicago, Cleveland, Buffalo,
Or any port you want to go,
The shortest time and lowest rate
Are shipmates with the Nickel Plate.

A SUPERB DINING CAR SERVICE.

For particulars inquire of

A. W. JOHNSTON,
Genl. Supt.or, B. F. HORNER,
Genl. Pass. Agt.

CLEVELAND, O.

OIL BAGS for CALMING the WAVES.

A Barrel of Oil and a Durable Oil Bag with capacity
for a Gallon of Oil, delivered aboard Vessels
in Cleveland for **\$10.**

The bag has attachments that permit of its being slid down the anchor chains when the vessel is at anchor, or thrown to windward when the vessel is moving. As the vessel comes up to it, the bag can be hauled aboard by means of a line, and thrown ahead from time to time.

The expenditure of \$10 may save your vessel.

STORM OIL BAG CO.

123 River Street,

CLEVELAND, OHIO.



DON'T BE DOPEY!

HELP YOURSELF and at same time help us.
"EUREKA" Packing will outlast 3
to 4 times any other.

ROBERTSON THOMPSON INDICATOR
will push you further ahead in your profes-
sion than anything else. **\$40.**

Hine & Robertson Co. 40 Cortlandt St. N.Y. Send for Catalog.



An Opportunity for ENGINEERS!

An Indicators for Sale Cheap.

Calkins Steam Engine Indicator, Planimeter, Pantograph
extra springs, and three way cock—full outfit for
taking indicator cards—regular price \$40—our
price \$35.

MARINE REVIEW,
516 Perry-Payne Bldg., Cleveland, O.

Handsome Photographs of Lake Steamers.

For some time the REVIEW has been planning to secure photographs of lake vessels under way, giving an artistic marine scene as well as a picture of the vessel. Arrangements have been completed and the first consignment has been received. They are 8 by 10 inches on tea colored mounts and will be sent to any address. We have a number in stock, and as more are being taken every few days we can furnish prints of almost any of the modern freight steamers at \$1 each. The following are on hand

J. J. McWilliams,	J. N. Glidden,	Cherokee,	D. Leuty,
Yukon,	Wawatam,	Majestic,	F. L. Vance,
Colgate Hoyt,	Briton,	Chas. Hebard,	Selwyn Eddy,
John Harper,	Pillsbury,	Saginaw Valley,	Forest City,
Gladstone,	Maritana,	S. S. Curry,	Wallula,
John V. Moran,	Malta,	H. J. Johnson,	Jim Sheriffs,
John Mitchell,	Quito,	Choctaw,	Zenith City,
Corsica,	City of Collinwood,	Victory,	Merida,
Annie M. Ash,	Pascal,	P. Pratt,	

Send \$1 to the MARINE REVIEW, 516 Perry-Payne Bldg., Cleveland, O.

STEAM YACHT AMADIS....

Will be for charter to private parties for long or short
cruises on the lakes or to the sea.

Address for particulars,

G. H. KIMBALL, 95 Adelbert St., Cleveland, O.

FOR SALE

60x10 ft. **STEAM LAUNCH**, 4½ Compound Engine
and Condensers, Steam Pumps, etc., Kitchen, Berths, fully
equipped, and in first-class order. For particulars inquire
Room 65, 94 La Salle Street CHICAGO, ILL.

FREE SAMPLE COPY OF HOME STUDY.

...An Elementary Journal for Students
Of Mechanics, Electricity, Architecture, Mining,
Plumbing, Heating and Ventilation, Steam En-
gineering, Civil Engineering and Mechanical and
Architectural Drawing.

HOME STUDY, Box 965
SCRANTON, PA.

HARVEY D. GOULDER,
LAWYER AND PROCTOR IN ADMIRALTY,
CLEVELAND, O.

ALBERT J. GILCHRIST, PROCTOR IN ADMIRALTY,
No. 604 PERRY-PAYNE BLDG., CLEVELAND, OHIO.

C. E. KREMER, Attorney and Counselor-at-Law and
Proctor in Admiralty.
Rooms 14, 15 and 16, Bryan Block, 164 LA SALLE ST., CHICAGO, ILL.

BROWN & COOKE,
Counselors at Law and Proctors in Admiralty,
106-107-108 White Building, BUFFALO, N. Y.

HAWGOOD & MOORE W. A. HAWGOOD.
J. W. MOORE.
Vessel and Insurance Agents,
Residence Phone, Doan 446—W. A. Hawgood.
Long Distance Tel. 2395. 608 Perry-Payne Bldg., CLEVELAND, O.

BARTOW & GILCHRIST, TELEPHONE 717.
Vessel and Insurance Agents,
611 and 612 Perry-Payne Bldg., Cleveland, O.

ALEX. CLARK. J. B. HALL. J. H. KILLERAN,
Marine Surveyor.
A. Clark & Co. VESSEL AND INSURANCE AGENTS,
Tel. No. 892. 55 Main St., BUFFALO, N. Y.

JOHN MITCHELL. JOHN F. WEDOW. ALFRED MITCHELL.
MITCHELL & CO.,
Vessel and Insurance Agents,
508, 509 and 510 Perry-Payne Building, CLEVELAND, OHIO
Office Telephone, 787. Residence, John Mitchell, 3506.

C. R. JONES & CO., VESSEL AGENTS,
FIRE AND MARINE INSURANCE.
Nos. 501, 502 and 503 Perry-Payne Bldg., CLEVELAND, O.

H. S. LORD. J. H. NORTON.
LORD & NORTON,
Attorneys-at-Law,
Proctors and Advocates in
Admiralty,
DULUTH, MINN.

White, Johnson & McCaslin,
ATTORNEYS-AT-LAW,
—AND—
Proctors in Admiralty,
26-27 Blackstone Building,
CLEVELAND, - OHIO.

THOS. WILSON,
MANAGING OWNER
WILSON'S TRANSIT LINE.
Gen. Forwarder.
Freight and Vessel Agent.
CLEVELAND, O.

C. F. Palmer. C. L. Hutchinson
PALMER & CO.,
Vessel Agents and Underwriters,
515 Perry-Payne Bldg., Cleveland, Ohio.
Telephone 644.

The M. I. Wilcox
CORDAGE & SUPPLY CO.
Steamboat, Vessel and Mill
Supplies.
STEAM YACHT, "MINNIE D."
210-216 Water Street,
TOLEDO, OHIO.

ORESTES C. PINNEY,
Lawyer and Proctor in Admiralty.
Rooms 722 and 723 Perry-Payne Bldg.
CLEVELAND, OHIO.
Telephone 2585.

C. W. ELPHICKE. JAS. A. MYERS.
A. L. FITCH.
C. W. ELPHICKE & CO.
GENERAL INSURANCE AGENTS,
Room 10, No. 6 Sherman St., Chicago, Ill.

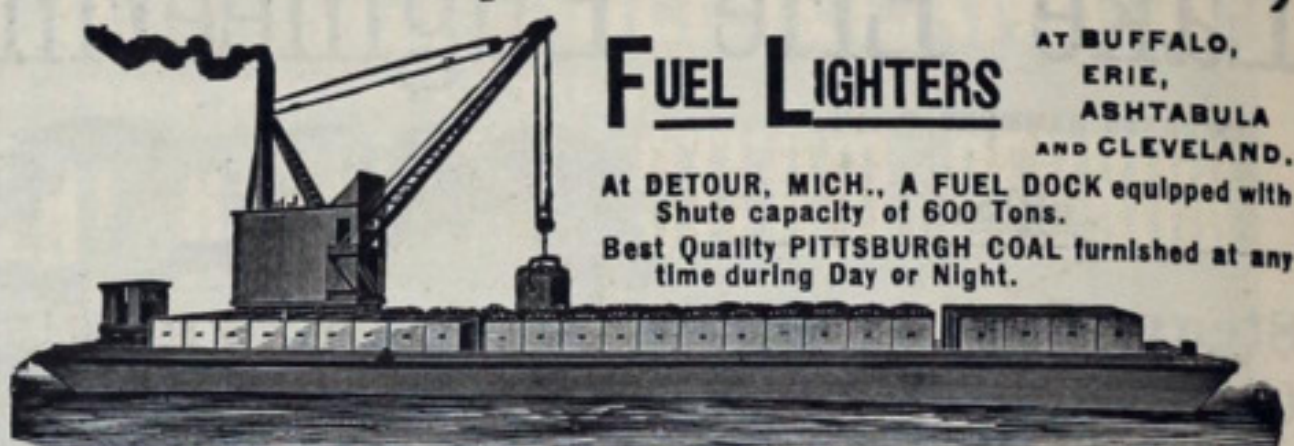
H. J. WEBB & Co.
SHIP BROKERS, VESSEL OWNERS and AGENTS,
Established in 1866. H. J. Webb & Co.
will charter vessels for the lake trade.
Special attention given to chartering ves-
sels in the Lake Superior Iron Ore trade,
both for the season and single trip.
No. 606 & 607 Perry-Payne Building,
Cleveland, O. Office Telephone No. 338,
Residence No. 3228.

J. T. ROSE. FRANK B. LAZIER.
ROSE & LAZIER,
Vessel Agents and Brokers,
and Marine Insurance,
16 Board of Trade,
DULUTH, - MINN.

VANDUZEN Steam JET PUMPS
THE BEST IN THE WORLD.
Pumps any kind of Liquid. Always in order.
Never clogs nor freezes. Fully Guaranteed.
COST \$7 AND UPWARD. Especially useful for
Mines, Quarries, Pits, Wells, Clay Pits, Breweries,
on Steamships, Ferryboats, Sugar Plantations, etc.
A full stock always on hand.
Descriptive Catalogue and Prices fur-
nished Free. THE E. W. VAN DUZEN CO.,
Cincinnati, O.

PATENTS
Promptly secured. Trade-Marks, Copyrights
and Labels registered. Twenty-five years ex-
perience. We report whether patent can be
secured or not, free of charge. Our fee not due
until patent is allowed. 32 page Book Free.
H. B. WILLSON & CO., Attorneys at Law,
Opp. U. S. Pat. Office. WASHINGTON, D. C.

Pickands, Mather & Co.,



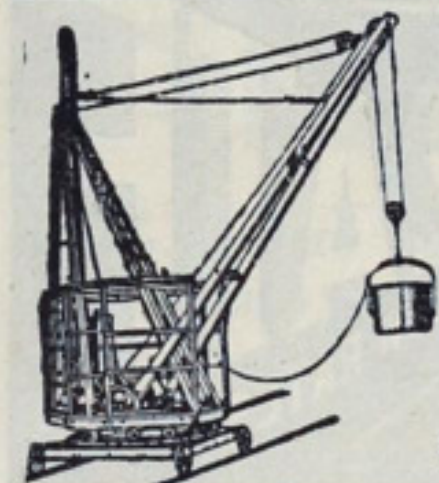
Western Reserve Building, CLEVELAND, O.

Ohio & Pennsylvania Coal Co.

FUEL DEPARTMENT.
MINERS AND SHIPPERS,
Youghiogeny and Ohio Steam Coals. Steamboats, Tugs, etc., Coaled day or
night, DOCKS FOOT WEST RIVER STREET. WHISKEY ISLAND GOVERNMENT
PIER and C. & P. R. R. SLIPS. Also STEAM LIGHTER—Equipped with
Revolving Derrick and (100) two ton buckets.
Telephone 1608. Office, 130 West River St., CLEVELAND, OHIO.

THE PITTSBURGH AND CHICAGO GAS COAL CO.

MINERS AND SHIPPERS OF
Pittsburgh and Youghiogeny Coal.
Fuel Docks West Side of Main River, Cleveland, Ohio, just above Main St. Bridge.
Latest equipment for rapid fueling of Steamers at all hours, day or night.
Fuel Lighter 300 tons capacity; buckets 2½ tons capacity.
Telephone { Office 1888.
Fuel Dock 1590.
Ore Dock, 2413. J. A. DONALDSON, Agent,
420-421 Perry-Payne Building.



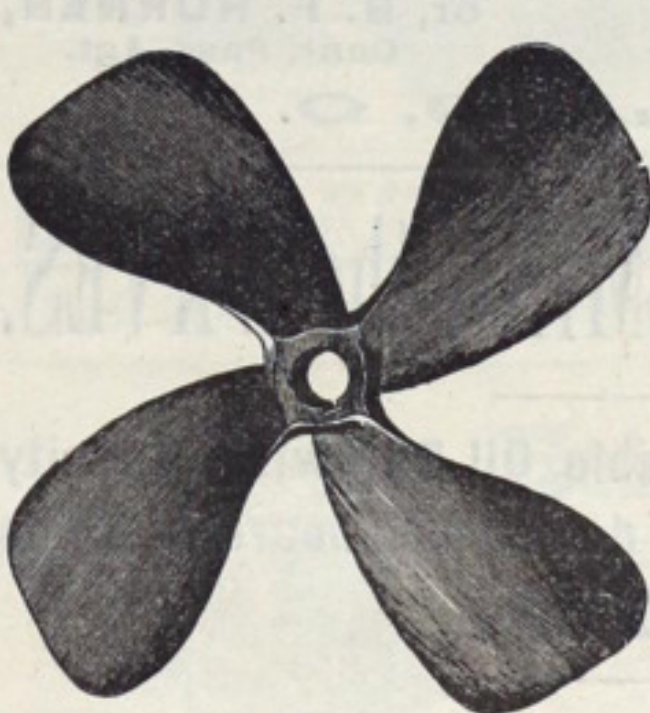
TOLEDO FUEL CO.,

Cambridge, Hocking, Jackson
and Massillon Coal
Wheeled on or put on with DERRICK.
NIGHT OR DAY.
SATISFACTION GUARANTEED.
H. H. WILLIAMS, Manager.
Located on Penn. Dock, TOLEDO, O.
GET OUR PRICES. Phone 1441.

H. A. BARR, PRESIDENT, F. H. VAN CLEVE, Sec. CAPT. GEO. BARTLEY, SUPT.
Escanaba. Escanaba. Escanaba.

ESCANABA TOWING & WRECKING CO., Escanaba, Mich.
Tugs, Lighters, Steam Pumps, Hawsers, Hydraulic Jacks and Diving Appliances always ready.
TUG MONARCH, { Engine Compound, Cylinder 16 and 30 inches diameter, 30 inch-
Stroke, Steam Pressure Allowed, 125 pounds.
TUG DELTA, { Cylinder 20 by 22, Steam Pressure Allowed, 105 pounds.
TUG OWEN, { Cylinder 20 by 20, Steam Pressure Allowed, 104 pounds.
CENTRIFUGAL PUMPS, Seven and Fourteen Inch Suction

H. G. TROUT,



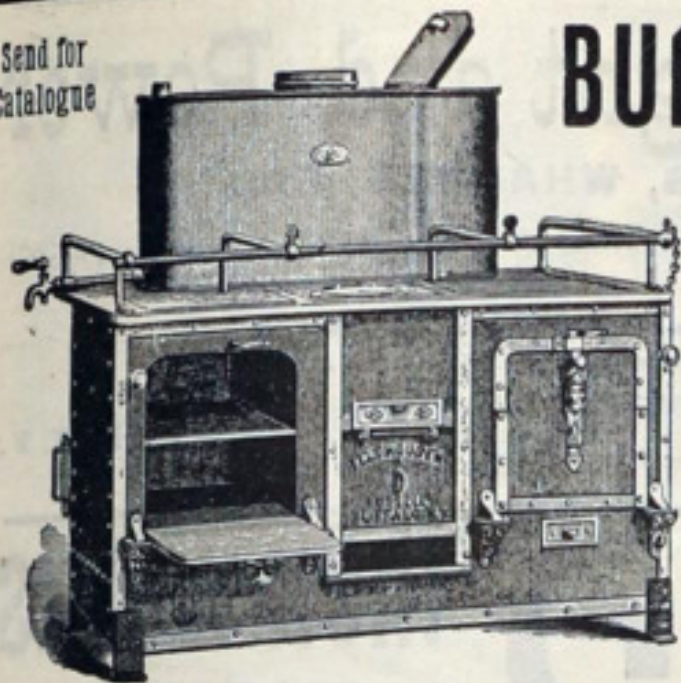
KING IRON WORKS,
BUFFALO, N. Y..
MANUFACTURERS OF
TRIPLE EXPANSION,
THREE CYLINDER,
FORE AND AFT
And STEEPLE COMPOUND
MARINE ENGINES,
High and Low Pressure Engines,
Sectional Propeller,
Tug and Yacht Wheels.
Cowles Aluminum and Manganese
Bronze Propeller Wheels.

These Wheels are noted for their extra
speed, towing power and propor-
tionate saving of coal.

PRICES QUOTED ON APPLICATION.

PRIVATE CAR FOR SALE

or Exchange for a Steam Yacht.
—FOR FULL PARTICULARS, ADDRESS—
E. D. BROWN, - 26 River St., - CHICAGO, ILLS.

Send for
Catalogue

BUFFALO WROUGHT STEEL RANGES

Steamboat and Vessel
Ranges and Boilers,
with patent Rotary
Grate.

SOMETHING NEW AND GOOD.
We also carry the STAMFORD TUG
AND YACHT GALLEY STOVES.

RUSSELL & WATSON

Successors to Felthousen & Russell.
145 Main St., BUFFALO, N. Y.

PINTSCH GAS LIGHTED BUOYS

Adopted by the English, German, French, Russian, Italian,
and United States Light House Departments, for
channel and harbor lighting; over 500 gas
buoys and gas beacons in service.

BURN CONTINUOUSLY from 80 to 365 days and nights without atten-
tion, and can be seen a distance of six miles.
Brilliant and steady illumination.
Economical and reliable in operation.

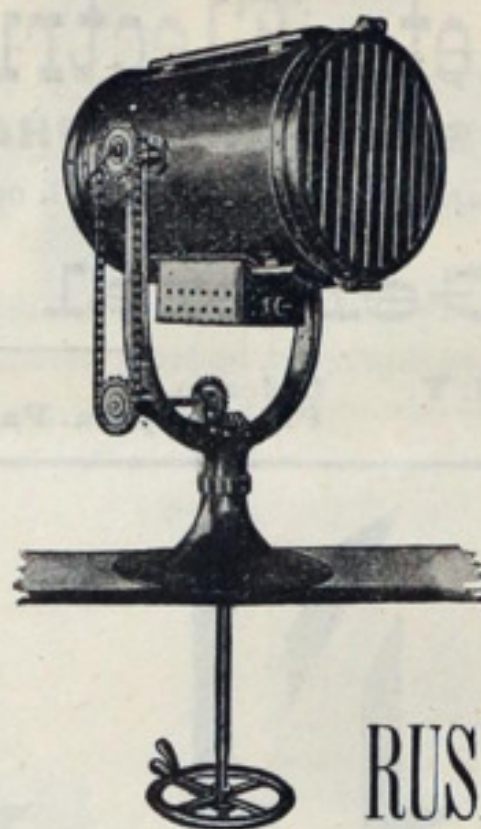
CONTROLLED BY THE

SAFETY CAR HEATING & LIGHTING COMPANY,
160 Broadway, New York City.

C
O
A
LC
O
A
L

ALL NEW HYDROGRAPHIC CHARTS ARE KEPT IN STOCK BY THE
MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND.

CAPTAINS AND MATES ARE INVITED TO CALL AT THE OFFICE OF THE
MARINE REVIEW AND LOOK OVER THE CHARTS AND SAILING DIRECTIONS
OF LAKES SUPERIOR, MICHIGAN, HURON, ERIE AND ONTARIO, PUBLISHED
BY THE HYDROGRAPHIC OFFICE.



Type D. Pilot House.

PROJECTORS!

10 MILLION TO
100 MILLION
CANDLE POWER.

The only successful commercial light.

Adopted and endorsed by leading
steamship lines and builders.

Have Replaced All Other Makes.

CATALOG NOW READY.

RUSHMORE DYNAMO WORKS,

JERSEY CITY, N. J.

THE

Swain Wrecking Co.

E.M. PECK, Pres.

The TUG FAVORITE
STATIONED AT CHEBOYGAN, MICH.
WITH COMPLETE WRECKING OUTFIT
IN CHARGE OF
Capt. P. L. Millen
CANADIAN WRECKER-SAGINAW
STATIONED AT DETROIT, MICH.
ENABLES US TO WRECK IN CANADIAN
WATERS
STEAM PUMPS AND SUB-MARINE
WORKS IN CHARGE OF
JOHN S. QUINN.
Address all communications to
PARKER & MILLEN
OFFICE
15 ATWATER ST. WEST
DETROIT, MICH.

4 STEAM PUMPS, 10 JACKS, 3 HAWERS.

1 COAL and ORE PUMP
3-12 INCH ROTARY.
1-14 INCH WORTHINGTON.

DIVING RIGS
AND
DIVERS
ABOARD
AT
ALL TIMES

1896 MAY.

3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

10-100 TON JACKS
1-12 INCH HAWSER
1-10
1-9

TELEGRAPH
PARKER & MILLEN,
DETROIT, MICH.

STERLING, WELCH & CO.

12 and 14 Euclid Ave., CLEVELAND, O.

BOAT FURNISHING A SPECIALTY.
CARPETS, OIL CLOTHS,
CURTAINS, &c., &c.

SUPPLIED AT WHOLESALE RATES.

MARINE VALVE OIL FOR INTERNAL LUBRICATION.

RENOWN ENGINE OIL FOR EXTERNAL LUBRICATION

Marine Valve,
Renown Engine,

Eldorado Engine,
Crank Case,

Victor Signal,
Dark Lubricating,

Mineral Seal,
Head Light,

Artic Cup Greases,
and Lard Oils.

— CARRIED IN STOCK AT THE —

STANDARD OIL COMPANY'S MARINE DEPOT,

TELEPHONE 77.

123 River Street, CLEVELAND, O.

MAIN OFFICE TELEPHONE 682.

ALSO FOR SALE
BY
**STANDARD OIL
COMPANY,**

Chicago, Ill., No. 5 Wabash Ave.
Racine, Wis.
Milwaukee, Wis., Broadway & Mason.
Sheboygan, Wis.
Manitowoc, Wis.
Green Bay, Wis.

Marinette, Wis.
Oshkosh, Wis.
Duluth, Minn.
West Superior, Wis.
Hancock, Mich.
Marquette, Mich.

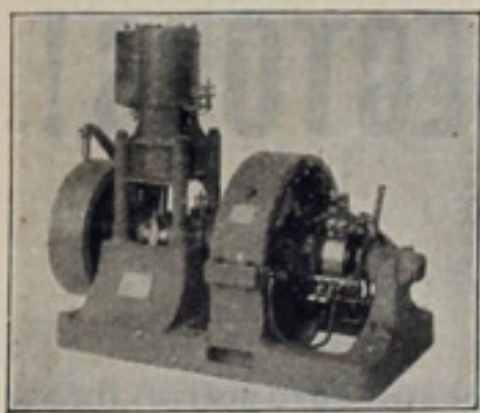
Buffalo, N. Y.
Sault Ste. Marie, Mich.
West Bay City, Mich., M.C. Ry. & 10th St.
Saginaw, Mich., Eighth & Sears Sts.
Detroit, Mich., 46 Jefferson.
Toledo, O., Summit & Monroe Sts.

A. H. MCGONAGIL, South Chicago, Ill.
MARINE SUPPLY Co., Fairport, O.
F. KRANZ, Sandusky, O.
THE M. I. WILCOX CORDAGE & SUPPLY Co., Toledo, O.

EDWARD BRAMMALL, Bnton Harbor, Mich.
BABY & DALE, St. Clair, Mich.
N. C. ALLEN, Lorain, O.
A. F. HARRINGTON, Conneaut Harbor, O.

ATLANTIC REFINING COMPANY, French & 16th Sts., Erie, Pa.
D. ROBSON, Port Huron, Mich.
W. S. MCKINNON, Ashtabula Harbor, O.
BULL & RAND, Huron, O.





Complete Electric Plants for Light and Power

On STEAMSHIPS, WHALEBACKS, YACHTS, DOCKS, WHARVES, Etc.

Our system is complete in every detail. All our appliances are made to Governmental and Insurance requirements and are perfect. Write for prices and catalogues.

General Electric Company.

SALES OFFICES

Schenectady, N. Y.
Boston, Mass.

Chicago, Ill.
Philadelphia, Pa.

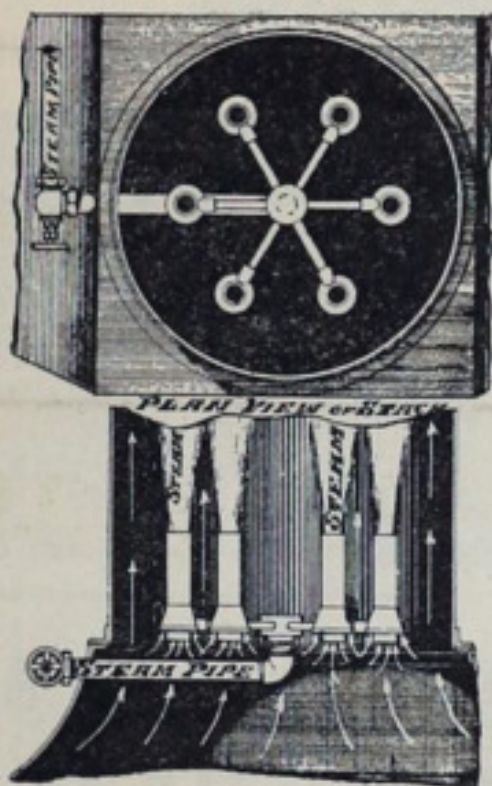
Detroit, Mich.
Baltimore, Md.

Buffalo, N. Y.
Portland, Ore.

Columbus, O.
New York, N. Y.
San Francisco, Cal.

FRONTIER IRON WORKS

MARINE
ENGINES,
DETROIT, MICH.



The Annular Steam Jet

For Smoke Stacks of Steam Boilers.

Acknowledged as the most powerful and economical jet on the market, giving results equal to forced draft with fan. Works well at all steam pressures.

In use on the fast Sound Steamer City of Lowell and famous Delaware River Strs. City of Chester and Brandywine, together with several Cuban and Mexican Strs. Also many Steamships, Side Wheel and Propeller, Lake, Bay and River Strs. Cut on the right shows sectional view of castings, which are spaced at equal distances throughout the stack, making an equal subdivision of its area. These castings are attached to pipes radiating from a central casting attached to steam pipe, as shown on the left. Steam is supplied through these pipes to each casting discharging through an annular opening, as shown by dotted lines, causing a current of air and gases to flow through the central and outside air passages, and discharge at a high velocity up the stack, as shown by arrows. Prompt delivery of orders guaranteed.

Address

H. BLOOMSBURG & CO.,

Main Office, Newport News, Va.

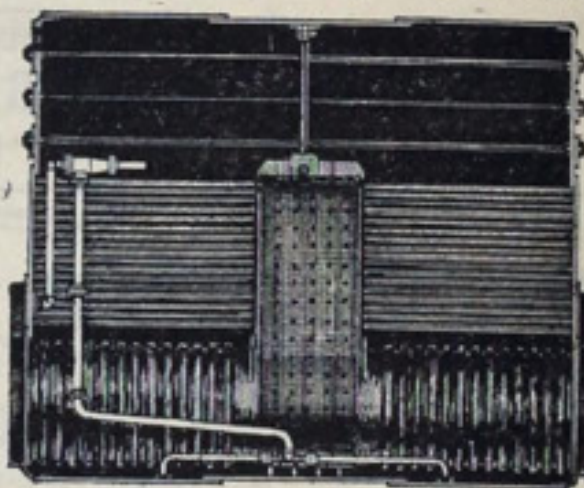
Branch Office, 818 Adams St., Wilmington, Del.

The Equilibrium Circulator

For Heating and Circulating the Water in Steam Boilers.

Equalizes expansion and increases evaporation, thereby saving coal and preventing leaks, thus saving cost of repairs. Prevents foaming or priming and pitting, thus increasing safety and prolonging life of boiler.

In use on the International Nav'n Co's Steamers Paris, Southwark, Pennsylvania and Illinois; Steam Ships Gloucester and Howard of Merch'ts and Miners Line; Sound Steamers City of Lowell and Richard Peck; fishing steamer Al. Foster; Delaware River Steamers City of Chester and Brandywine; and many steam yachts and tug boats, giving remarkable results. Used by Harlan & Hollingsworth Co., Bath Iron Works, Maryland Steel Co., and others. Castings carried in stock for prompt delivery.



Circulating Apparatus in Boilers of the Ocean Grehound Str. Paris.

Bethlehem Iron Company

WORKS and PRINCIPAL OFFICE:

SOUTH BETHLEHEM, PENNA.

Steel Forgings of all descriptions

For **Marine Engines**

Fluid Compressed, Hollow, Hydraulic Forged and Annealed Forgings a Specialty.

NEW YORK OFFICE, - - - **100 Broadway.**

PHILADELPHIA OFFICE, - - - **421 Chestnut St.**

CHICAGO OFFICE, - - - **Marquette Bldg.**

The United States Standard Register of Shipping.

Providing the only Standard Classification based on Construction Rules Designed for Lake Vessels.

Classed Vessels Receive the Lowest Rates of Insurance.

SURVEYORS.

SINCLAIR STUART, Surveyor of Iron and Steel Construction and Engineer

as, and including Cleveland, O. Surveyor for District comprising Lakes Superior, Michigan and Huron and Lake Erie, as far East

EDWARD CASKIN, Potter Building, Main Street, Buffalo, N. Y., Surveyor for District comprising Lake Ontario and Lake Erie, as far West as, but not including Cleveland, O.

Application for survey of vessels and subscriptions to Register Book will be received by the surveyors or at the office of

The United States Standard Steamship Owners', Builders' & Underwriters' Ass'n, Ltd.
Post Building, 16 and 18 Exchange Place, NEW YORK.

FOR SALE at a Bargain.

The tug Henry—Cylinders, 16½x18; new steel boiler; steel boiler house; hull in first-class condition. This is a most favorable opportunity to procure a first-class tug for dredging outfit. For particulars apply to

WILLIAM TRUBY,

Fairport Harbor, O., where tug can be seen.

LONG LIFTS

SELLERS' RESTARTING INJECTOR

HOT WATER

WIDE RANGE

LONG SERVICE

Simplest and Best

For Stationary, Portable, Traction Engines, Tugboats, &c.
Thoroughly Reliable—Perfectly Automatic.
JENKINS BROS., - Selling Agents.
NEW YORK, BOSTON, PHILA., CHICAGO.

The COAST LINE to MACKINAC



TO MACKINAC
DETROIT
PETOSKEY
CHICAGO

2 New Steel Passenger Steamers

The Greatest Perfection yet attained in Boat Construction—Luxurious Equipment, Artistic Furnishing, Decoration and Efficient Service, insuring the highest degree of

COMFORT, SPEED AND SAFETY.

FOUR TRIPS PER WEEK BETWEEN

Toledo, Detroit & Mackinac

PETOSKEY, "THE SOO," MARQUETTE, AND DULUTH.

LOW RATES to Picturesque Mackinac and Return, including Meals and Berths. From Cleveland, \$18; from Toledo, \$15; from Detroit, \$13.50.

EVERY EVENING

Between Detroit and Cleveland

Connecting at Cleveland with Earliest Trains for all points East, South and Southwest and at Detroit for all points North and Northwest.

Sunday Trips June, July, August and September Only.

EVERY DAY BETWEEN

Cleveland, Put-in-Bay & Toledo

Send for Illustrated Pamphlet. Address

A. A. SCHANTZ, S. P. A., DETROIT, MICH.
The Detroit and Cleveland Steam Nav. Co.

UNITED STATES ENGINEER OFFICE.
185 Euclid Avenue, Cleveland, O., July 1, 1896. Sealed proposals for constructing a stone and brush jetty from Cedar Point at Sandusky Harbor, Ohio, will be received here until 2 o'clock, p. m. standard time, August 7, 1896, and then publicly opened. Information furnished on application. **JARED A. SMITH,** Lieut. Col. Engrs. Aug. 6.

S. F. HODGE & CO.

MARINE ENGINES,
PROPELLER WHEELS,
DECK HOISTERS,
MARINE REPAIRS.
320 ATWATER STREET,
DETROIT, MICH.



BLUE BOOK OF AMERICAN SHIPPING.....

PUBLISHED BY THE

MARINE REVIEW,

409 Perry-Payne Building,
CLEVELAND, OHIO.

Answers questions arising daily in regard to the management of lake vessels.

It contains Lists of Names—Owners, Captains and Engineers—for Circulating Purposes, any one of which is worth the price of the book, \$5.

Money refunded if book is not satisfactory.

BAR IRON THE BOURNE-FULLER CO. PIG IRON

CLEVELAND, O.

BOILER RIVETS, BOILER TUBES, IRON PIPE,

SALES AGENTS:

THE CARBON STEEL CO.

MANUFACTURERS OF

OPEN HEARTH STEEL

SHIP, BOILER, BRIDGE AND
TANK PLATES, &c., &c.

BOAT SPIKES,
CLINCH RINGS, &c.

HIGH GRADE MATERIALS FOR
VESSEL CONSTRUCTION
A SPECIALTY.

SALES AGENTS:

THE CAMBRIA IRON CO.

MANUFACTURERS OF

OPEN HEARTH

AND BESSEMER STEEL

ANGLES, BARS, CHANNELS,
BEAMS, TEES, ZS, &c.

De Grauw, Aymar & Co.,
34-35 South Street,
NEW YORK, N. Y.

Sole Selling Agents
in the
United States
for

**TYZACK'S
STOCKLESS ANCHORS**

Over 40
of these Anchors
on Lake Vessels.

The McIntosh-Huntington Co.,
CLEVELAND, O.

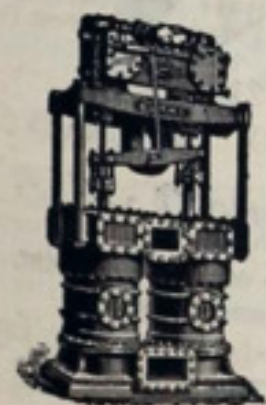
PENBERTHY INJECTORS,
DAVIS PRESSURE REGULATORS,
RAINBOW PACKING,
VALVES AND FITTINGS. VACUUM PACKING.

THE GEO. F. BLAKE MFG. CO.

BUILDERS OF

MARINE PUMPS

Single and Duplex Pumps for Boiler Feed,
Fire or Bilge Service—Vertical and Horizontal.
Vertical and Horizontal Pumps, Air Pumps
for Surface and Jet Condensers.



AIR PUMP ON
U.S. CRUISER NEW YORK.

95 and 97 Liberty St., NEW YORK.

**STEAMBOAT CAPTAINS,
ENGINEERS, CREWS,**
BUY RAILROAD TICKETS

READING

**Flint & Pere Marquette
R. R.**

WHEN GOING TO

**SAGINAW BAY CITY,
MANISTEE,
LUDINGTON, MILWAUKEE.**

SHORT LINE,

CHEAP RATES.

**A. PATRIARCHE, Traffic Mgr.
SAGINAW, MICH.**

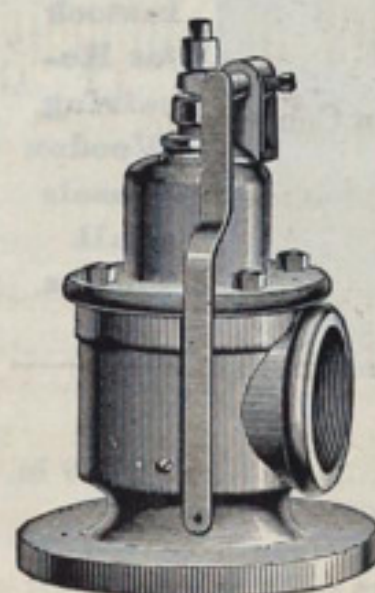
**FRANKLIN
HOUSE**

ESTABLISHED 1837.

Cor. Bates and Larned Sts.,
DETROIT, MICH.

Only a Block from Woodward &
Jefferson Aves. Very Central.
Near All Car Lines.

Per Day, \$1.50. **H. H. JAMES, Prop.**



**CROSBY STEAM GAGE
AND VALVE CO.,**

Sole Proprietors and Manufacturers of

Crosby Pop Safety Valves and Water Relief Valves. Crosby Improved Steam Gages, Single Bell Chime Whistles, Patent Gage Testers, Victory Lubricators, and other specialties.

The Crosby Steam Engine Indicator, when required, is furnished with Sargent's Electrical Attachment, by which any number of diagrams can be taken simultaneously.

BRANDEN PUMP VALVES, rubber with wire-coil insertion. Manufacturers of all kinds of Pressure and Vacuum Gages, Water Gages, Gage Cocks, Radiator Cocks, and other Engine and Boiler Fittings and Supplies.

Branch Offices at New York, Chicago and London,
Main Office and Works at BOSTON, MASS

Bertram's Oil Polish, The Marine Polish of the World.

U.S. government in the marine departments. For sale by ship chandlers and engineers supplies stores.

For Brass and all Metal Surfaces it is unequalled. It is cheaper requires less work and retains its brilliancy longer than any metal polish made. Acknowledged the standard of excellence by the BERTRAM OIL POLISH CO., 220 & 22 State St., BOSTON, MASS.

THE BEST IS WHAT YOU WANT

ASK FOR IT.

PEERLESS STEAM AND WATER HOSE



.... MANUFACTURED EXCLUSIVELY BY THE

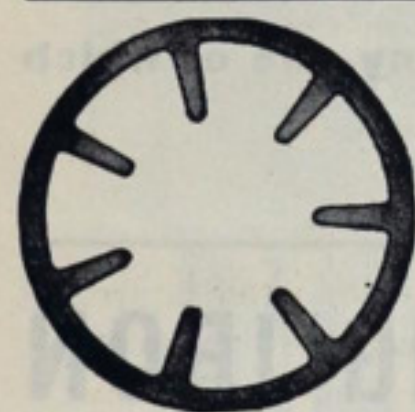
PEERLESS RUBBER MFG. CO.

16 WARREN STREET, NEW YORK.

FOR SALE BY

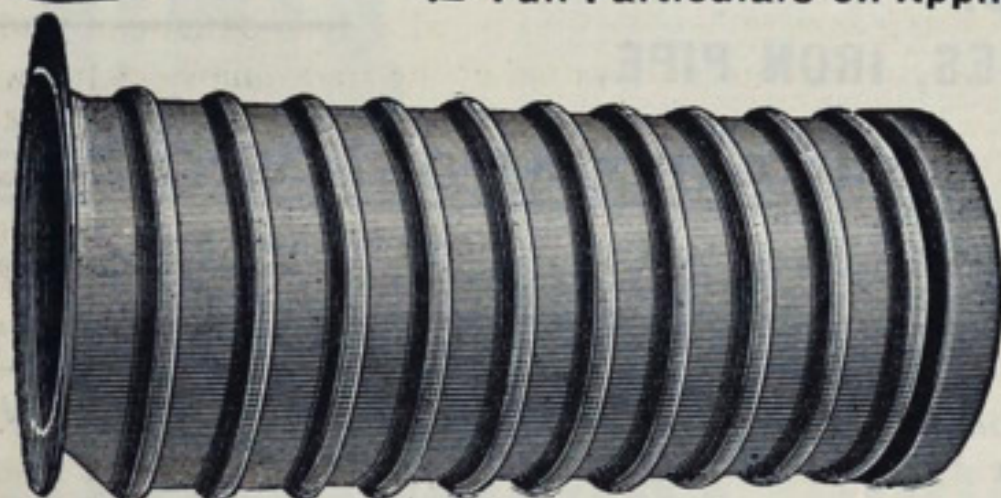
LEADING SHIP CHANDLERS AND SUPPLY HOUSES.

Serve's Steel Ribbed Boiler and Stay Tubes



Show an average economy in fuel of 15 per cent. In steamers this means not only so much saving in cost of coal or increased power, but additional freight capacity.

Full Particulars on Application.



PURVES' RIBBED STEEL BOILER FURNACE FLUE.

With this style of Furnace Flue the rivets at the "back ends" are out of the line of fire, and all that has to be done to remove it is to cut out the rivets at the ends and slip it through the front; and to replace it, simply to slip it back in its place and rivet up the ends again without disturbing any part of the boiler. No smithwork is required to fit it on a boiler or to refit it when replaced. It is ready for use as it comes from the manufacturers. This style of flue has been in use six years without a single complaint.

Over 14,000 of Purves' Ribbed Steel Furnace Flues in successful use in Marine Boilers.

Ellis & Eaves System of Induced or Suction Draft.

CHARLES W. WHITNEY, Sole Agent for the United States and Canada, 64, 66, 68 BROADWAY, NEW YORK

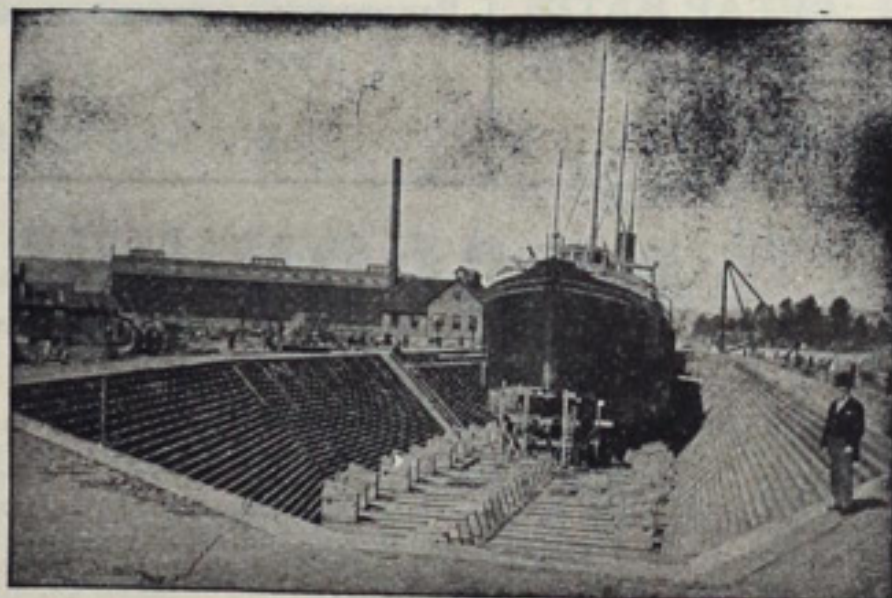
AMERICAN STEEL BARGE CO. STEEL and METAL SHIPS

Of all classes built on the Shortest Possible Notice at our yards at

West Superior, Wis., and also at Everett, Wash.

Photograph of 300 ft. Boat in Dock.

Plates & Material Always on hand to Repair all kinds of Metal Ships in Shortest Time.



Best Quality of Oak in stock for Repairing Wooden Vessels of all Classes.

SIZE OF DOCK.

Length, extreme.....537 feet.	Entrance, Top.....55 feet 9 in.
Breadth, Top 90 " 4 in.	Entrance, Bottom.....50 "
Breadth, Bottom 52 "	Depth over Sills18 "

LARGEST DRY DOCK ON THE LAKES.

Prices for Repairs and Docking same as at lower lake ports

SUPERIOR, WIS.

A number of Propeller Wheels in stock at Dry Dock.

H. W. Johns' Boiler and Pipe Coverings.

ASBESTOS MATERIALS OF ALL KINDS.

Wicking, Fibre, Mill Board, Felt, Packing, Cement, Liquid Paints, Roof Paints, Fire-Proof, Paints, etc.

Made in Sections Three Feet Long, to Fit Every Size of Pipe.

ABSOLUTELY FIRE-PROOF.



THE CHASE MACHINE CO.

111 ELM ST. CLEVELAND, O.

H. W. JOHNS' MFG. CO.

32 SOUTH WATER ST.

The Cleveland Dry Dock Co.

148 Elm St., Cleveland, O.

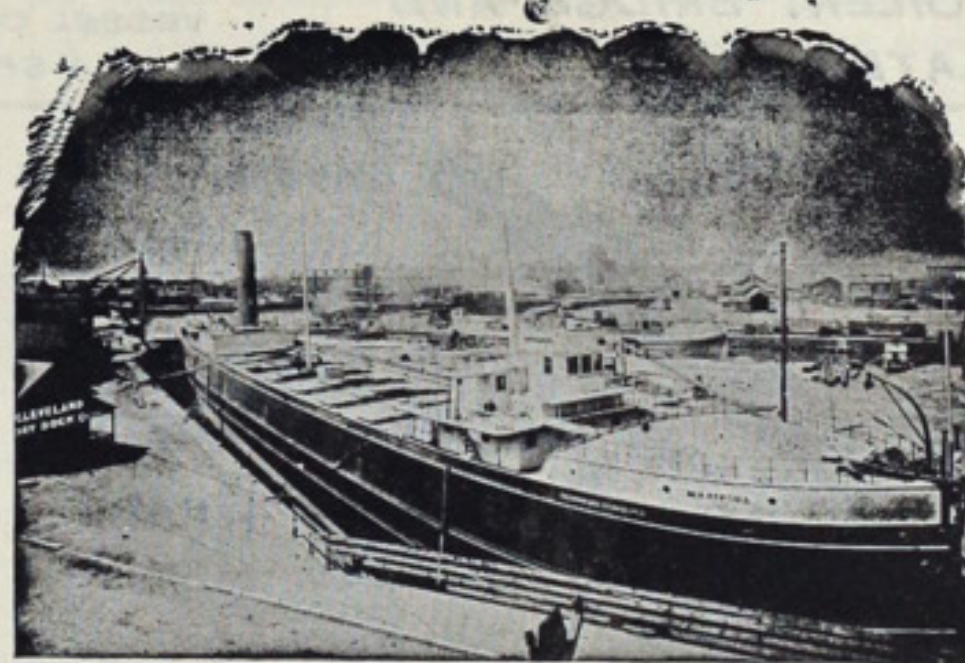
Telephone 1616. Resid. Phone 4080.

REPAIRING A SPECIALTY.

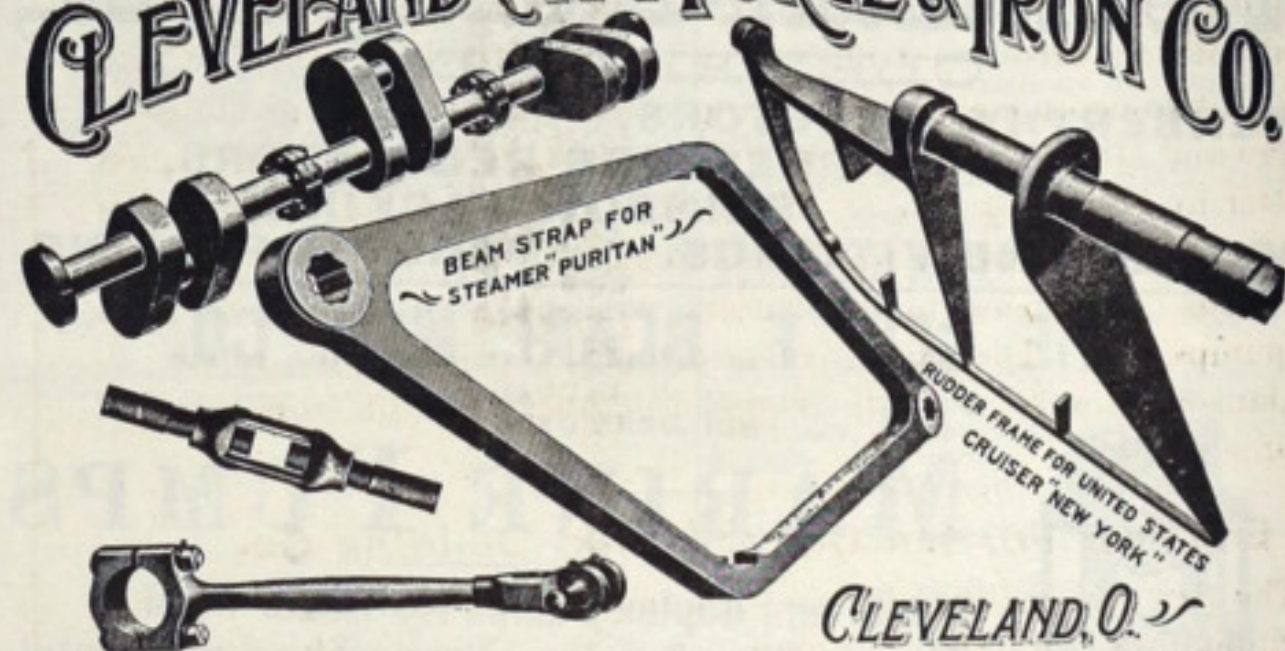
Dimensions of Dock:

Lth. over all, 360 ft.
Lth. on blocks, 340 ft.
Width of gate, 50 ft.
Depth over sill, 20 ft.

Capt. W. W. BROWN
Sec'y & Mgr.



CLEVELAND CITY FORGE & IRON CO.



IRON OR STEEL FORGINGS FINISHED COMPLETE, ROUGH MACHINED OR SMOOTH FORGED ONLY, OF ANY WEIGHT. COUPLING LINKS AND PINS. PRESSED WROUGHT IRON TURNBUCKLES. CAR IRON SPECIALTIES.

PROPOSALS FOR DREDGING PLANT.—U. S. Engineer Office, Morgan Building, Buffalo, N. Y., August 7, 1896. Sealed proposals for furnishing dredging plant in Niagara River will be received here until 11 a. m. September 7, 1896, and then opened. Information furnished on application. T. W. SYMONS, Major, Engrs. Sept. 3.